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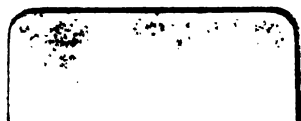
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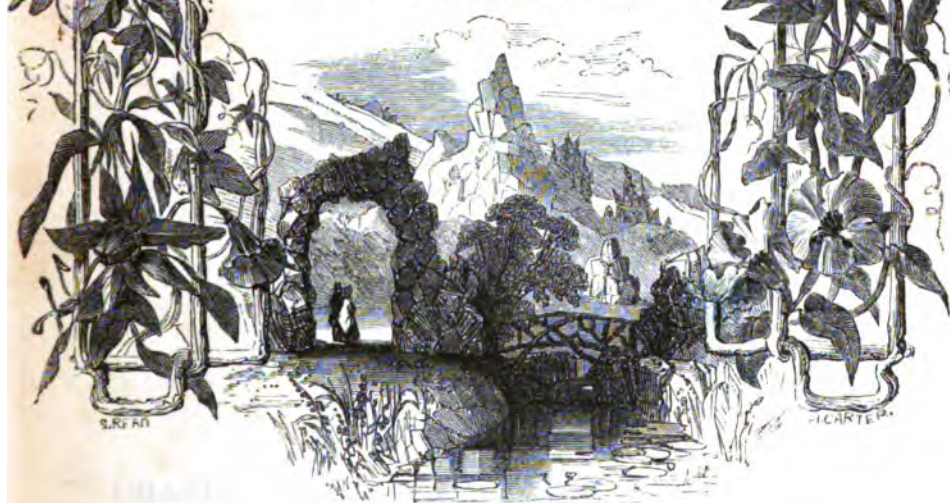


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ANNALS
OF
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THE

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AND

Pear-Book of Information

OR

PRACTICAL GARDENING,

FOR 1849.



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TO

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THE EARL OF AUCKLAND

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VICE-PRESIDENT OF THE HORTICULTURAL SOCIETY OF LONDON

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THE PROMOTER OF HORTICULTURE IN BRITISH INDIA

AND ITS FRIEND AND PATRON AT HOME

This Volume

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THE EDITOR.

P R E F A C E.

THERE are very few pursuits influenced by so many circumstances as Gardening; and we can imagine nothing more interesting to a lover of that healthful and delightful study than a collection of all the facts and figures that relate to it.

The raising of new varieties of Flowers, Fruits, and Vegetables, the importation of Foreign Plants, the scientific discoveries, the improvements in Culture, the results of experiments, &c.—are all matters of the deepest interest to the Amateur and the Professional Gardener, and indeed to all who take pleasure in, or who would keep pace with the advancement of Horticulture.

A faithful record of all these subjects, and indeed of all subjects of practical utility connected with Gardening, has been the object of this Publication; so that the “Annals of Horticulture” literally form a comprehensive History of Modern Gardening, embodying every improvement in the Science to the present day.

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ERRATUM.

Page 294, second column, for *Anthemis* read *Anthyllis*.



THE CHRYSANTHEMUM, AND ITS CULTURE.

BY GEORGE GLENNY, F.H.S.

THIS plant derives its chief attraction from the particular season in which it blooms. It is showy and varied, but it has neither elegance of habit, nor symmetry of form, nor fragrance to recommend it. The most remarkable of the flowers are notorious for their deformity, and although we have now British seedling varieties coming something nearer to a proper standard, we are far from attaining what must be the character of the plant and flower before it can be ranked among the better class of Florists' flowers.

Although a Chinese plant, our English varieties will soon outnumber and excel the original, and it will be, like the *Camellia japonica*, essentially English, or, at least, European, before many years pass over our heads. The plants are valuable as out-of-door ornaments in mild autumns, for they succeed the dahlia; and although a very severe frost will destroy foliage and flowers, they will live through a frost which will cut off the dahlia past recovery. They are, strictly speaking, half-hardy, but their beauty is frequently spoiled just as they are commencing their bloom. The plants, if grown in the ordinary way, are too tall to be handsome, and the lower leaves wither and turn brown before the blooms come to perfection, even when the season is suitable. This can only be counteracted by means of particular culture, and

we can only accomplish an improvement in the habit by carefully counteracting the general tendency of the plant to grow lanky and tall. In herbaceous borders, where the subjects are allowed to spread and throw up annually large bundles of stems, and where the general collection of masses bloom year after year in large heads, the appearance of the Chrysanthemum is very showy; and in such places they are undisturbed three or four years together; but this can be hardly called cultivation,—a hundred subjects that make very striking flowers under high culture, are but rough, though showy masses of bloom, when allowed to take their own choice. The carnation, pink, picotee, auricula, polyanthus, primrose, hyacinth, tulip, narcissus, and many other subjects which are noble under rich and judicious growth, spread and become large masses when left a few seasons, and, however pretty in these wilderness-like borders, possess no claims to notice for their individual flowers, nor for the form of their plants; yet, propagated yearly, or separated every season, or dug up and replanted properly and periodically, they preserve a character which is as superior as it is unlike the diminutive blossoms that come in hundreds. The Chrysanthemum, then, has to be looked upon in different stations; first, as a perennial herbaceous plant, in common borders, growing in

masses; secondly, as a dwarf showy plant, sufficiently protected to preserve its foliage in choice clumps or flower borders; thirdly, as a pot plant, to bloom under cover, and be removed wherever flowers are wanted.

AS HERBACEOUS PLANTS.

In all large concerns there are portions of the ground, especially distant from the dwelling, laid out as rough borders, in which herbaceous plants that require no culture are planted, to grow, spread, and bloom, year after year. Hollyhocks, Michaelmas daisies, Aaron's golden rod, perennial lupins, everlasting peas, early primroses, monk's-hood, digitalis, and a hundred other plants that die down and come up again, are planted and left without any other culture than forking the borders after they begin to grow, and giving an occasional dressing of some kind of manure. The Chrysanthemum ought to be among them, and form no small proportion of the whole. The yellow, primrose, white, red, brown, purple, and various other shades, may be planted in the spring. The ground ought not to be rich; vigorous growth is very much against hardiness. The plant that will live through a frost in poor ground, will perish in the same temperature if the land be rich. This has been found by the growers of broccoli. In hard winters acres have been cut off in rich ground, while that in less exciting soil has escaped. If the border is anything like good ordinary loam, it is better merely to see that it is well drained, and plant without any dung or dressing. As the plants advance in height stakes should be placed to tie them up to, so that they may not be broken by high winds, and in due time, if frost does not intervene, they will flower the first year, though not very strong. After the bloom is fairly off, and the beauty of the plant gone, they may be cut down to within four inches of the ground, and, if the weather be very severe, and litter can be had handy, a little thrown over the herbaceous border will protect many half-hardy subjects from damage. But there are many who do not think it worth the trouble, and therefore let all things take their chance. In the spring the plants shoot up much stronger, and require the same care as to tying to stakes; but in these rough borders a single stake is generally all that is bestowed, the branches being merely tied somewhat loosely together, something like a wheat-sheaf, for the head of bloom covers all over the top, and looks best in a mass, besides being less damaged by hard weather. In this way, year after year, the plants will grow up and spread until they form huge bunches, with great masses of flowers; and, when they become too large, they may be lessened by taking some of the

roots away, all round, with the plants attached to them. This may be done by chopping off with the spade; the pieces chopped off may be planted out elsewhere, or be used to make good any that are damaged or have died. The same management would apply also to all the other herbaceous plants of the kind, but our business is with the Chrysanthemum.

AS DWARF PLANTS IN BORDERS.

To make a naturally tall plant grow dwarf is not always an easy matter, but the facility with which the Chrysanthemum strikes enables us to take the tops off when they have made a considerable part of their growth, and thus produce the bloom upon a stem half the length that it would have been. We have always allowed the plants to grow as fast as they would, in a pit or greenhouse, or the open ground, but it is far better in the pit or greenhouse. In the months of June, July, and August, we have taken the tops of the strongest shoots, about three inches in length; these should be cut up to a joint, and the lower leaves cut off, so as to leave half to three quarters of an inch of bare stem. Now prepare some wide-mouthed pots, by putting one-third of crocks, and fill up within three quarters of an inch of the edge of the pot, tapping the bottom on the potting-table to settle the soil moderately close, and make it quite level. The soil ought to be half loam, one-fourth turfy peat rubbed through a coarse sieve, and a fourth rotten cow-dung, also rubbed through the sieve. Fill up the pot with silver sand, which will be, of course, three quarters of an inch thick on the other soil, and with a very gentle watering saturate the sand and the soil. Then take a bell-glass, that will just fit a little within the edge of the pot, and, having first made a mark by pressing the edge into the sand, stick in the cuttings, so that the bottoms touch the soil through the sand, and not more than an inch apart. A gentle watering will settle the sand down close to the stems, and the glass should be then covered over, pressed into the sand a little to exclude the air, and the pot should be placed in a slight hot-bed, in a propagating-house, or in a cool part of the stove, and be shaded from the rays of the sun by a paper over the bell-glass. Whether there be one or twenty pots is immaterial—the same process must be gone through with each and all. Every morning the glasses should be wiped dry and bright; cleanliness is everything with cuttings. The sand must be moistened whenever it gets nearly dry, and if any one of the cuttings exhibit anything like mildew or damping, remove it immediately from the pot, as there is nothing sooner caught than mildew or damp. In the course of a few days, comparatively, the cuttings will

begin to grow, and they are then in a fair way of striking. Continue your watchfulness, the drying of the glasses, the moistening of the sand, and removing any that appear inclined to damp off; and when they have grown, and exhibit any appearance of having struck, prepare for potting them off. Use pots of the size of forty-eight to the cast, or large sixties. Put crocks at the bottom enough to ensure good drainage. Use nothing but loam from rotted turves if you can get it. You do not want to excite rapid growth; on the contrary, the slower they grow the better, so that they keep growing in a healthy state; put some of the loam, say half or two-thirds full, and then turn out the ball from the cutting-pot, or hold them sideways, and strike them gently sideways; the sand will fall out, and the ball may be so loosened, that withdrawing the pot with a jerk will leave it on the bench. By pressing the ball it will part a little, so as to enable you to take the cuttings away one by one with earth about their fibres. Hold them upright in the pot, and place them so that the soil will come fully as high as the sand was. The earth should be pressed all round the root, moderately close, but not hard, and the pots knocked gently on their bottoms to settle the earth properly. After watering them, they should be placed in a frame, and the light covered down close the first day or two, and they must be properly shaded, or they will droop. Indeed they ought, if it were convenient, to be a little while in gentle heat, but this is rarely practicable, unless slight hot-beds were made on purpose. After the first day or two they must have plenty of air, and as soon as they have recovered the check they receive by transplanting, they may be removed to the open air on a hard bottom of pavement, or some contrivance which they cannot root into, for they will soon protrude their roots through the bottom of the pot, and strike them into a hard gravel walk if they are allowed to do so. They may have all the sun but an hour or two of the hottest in the middle of the day, but even this will not hurt them if they are kept well watered. The only danger is that, if they are neglected, the soil very soon bakes dry, and they then begin to suffer, and the leaves turn red or yellow. The best situation is a border which is protected from the midday sun, and made hard by paving, or having slates or wooden planks laid on; in a very short time the pots will be filled with roots, and a change will be required, but the plants will be just ready to turn out in the clumps, borders, &c., where they are to be flowered in their dwarf state. They may be planted out without dressing, three feet apart, to allow room for other subjects between them. They will flower at less than half the height

they would have attained without cutting and striking, besides which they will not have lost their foliage nor their colour. The plants that are put out thus, would the next year be just as tall as any other; and the only way to make them otherwise, is to take off the tops as we have described.

IN POTS AS DWARF FLOWERING PLANTS.

We have already described how the cuttings are to be taken and treated up to the filling of the first pots with roots. At the time when they are turned out as we have described for the beds and clumps, when dwarfing is an object, a certain portion may be continued in pots, but they will at that period require to be shifted into other pots a size larger. Nothing more need be done than striking the edge of the pot against the potting-table, while held the wrong way upwards; the ball will leave the pot whole. The crocks need not be disturbed, but a few being placed at the bottom of the new pot, and enough earth to just cover them, the ball may be placed in whole, as deep as may be, and the soil filled in all round, up as high as the edge of the new pot; if the soil come higher up the plant than before, so much the better; a gentle watering to settle the new earth round the ball will be necessary, and they may be then placed again in their out-of-door locality, attention being paid to their occasional moisture. They will all be more or less dwarf, according to the season, but in the general way they require no other attention. We have already stated that the time to take these cuttings may be June, July, or August; some, indeed, may be taken as late as September. It would be always found that the latest struck cuttings were the most dwarf when they bloomed, but it will be sometimes found difficult to strike the latest, and this is our chief reason for striking at different seasons. There will be no difficulty in procuring cuttings from the pots or out-of-door plants, but they answer better from potted plants, because they are always forwarder. They may again fill their pots with roots, and require a shift, but they ought to bloom in thirty-two sized pots, that is, pots of thirty-two to the cast, and technically called thirty-twos, and if they fill ever so much with roots, they must not be shifted into any larger, because you rather wish to check the growth than encourage it. In September the frost may come pretty sharply, and damage potted plants, so that about the middle of that month they should be placed in frames, and carefully closed and covered at night, on the least sign of severe weather; but if this be not expected or likely, the glass is covering enough. The latest struck cuttings may be kept under glass all through, for as they may be potted off the

first time as late as the end of August, they cannot draw up much, but they ought to have all the air that can be given in mild weather, and only be closed in cold winds, and of evenings towards the middle or end of September; after this period they will show their bloom-buds, and when these once appear the plants do not grow materially. If fine flowers are the object, they must not be checked with cold, and many persons make up a house full of them, and regulate the temperature with great exactness. It will, however, always be found that the less artificial heat they have, the better will be the colour of the flowers and foliage, and the latter will be retained best on the stems; which, in spite of the best management, will shrivel, turn yellow, or fall off altogether, when the plant is attempted to be forced, or, by the neglect of the watering, gets starved. It has been the custom of many nurserymen to take off cuttings as soon as they were strong enough; but the great object of taking cuttings is lost under this treatment. The plants run up nearly as tall as if they were not taken off at all, but were left to grow their full height; whereas, when their growth is half made, or even more than half, the tops have so much less to do, that they form really dwarf specimens when of the tallest kinds. Some, who appear to lose sight of the object in view, or, perhaps, never thought of it seriously, recommend cuttings to be taken in April, fancying, perhaps, they have made a great discovery, when they find that April cuttings strike more freely; but they answer no purpose, because in April they are scarcely any length, while the June, July, and August cuttings are taken from the top of shoots two feet long. Now, we will not say that the top of a shoot two feet long, that would only grow to three feet if left on, would only grow the other foot, because fresh impulse gives vigorous growth; but they will not grow one-half the length that April cuttings would, nor be half the trouble. The flowers as they advance and begin to open, become still more susceptible of damage by frost, and the prevention of this is the only care required at this late period of their cultivation. The nurserymen put them in houses, and give them a little heat, but the object is to bring them into flower earlier than they would come otherwise, and not with any hope of bringing them finer. Those in houses will commence flowering in October and November, and continue until some unlucky frost gets to them, or they may be removed from time to time into the places their flowers may be wanted in. But the culture of Chrysanthemums may be considered complete, up to the period when the buds swell, and the flowers are opening; the plants seldom grow much after that, unless they are

in heat, and shaded, and this should always be avoided, as much as possible, for the stems by elongating throw the leaves farther apart, and destroy the shrubby habit, which is, whether natural or artificially produced, essential to the beauty of the plant.

INCREASING THE BUSHY HABIT.

Although we may obtain from cuttings much more free growth and larger flowers, and by taking them late keep the plants very dwarf without topping, they may also be dwarfed a good deal more by topping the strong shoots, and encouraging laterals. This is resorted to chiefly for large specimens, but the small potted plants that we have been treating of may be topped as soon as they are fairly established, and the side branches grow more numerous, and get forwarder than they would otherwise. The plant becomes more bushy, but the foliage and flowers come smaller. In short, we obtain more branches and bloom, but we sacrifice size to number, and sometimes it will be found necessary to top the laterals as well, for they would grow nearly as long as the original shoot would, and we have known plants so managed difficult to bloom at all until very late in the winter. The way to manage these with the best chance of success, is to take one of the plants from the July cuttings, and as soon as it is planted out from the cutting-pot, and well established again, take off the top, leaving three inches, or if the plant be as short as that, merely pinch out the heart: as the laterals come out to the same length as the old plant was, they require to be stopped in the same manner, and in their turn will give out their laterals; and where these cross one another, or are in the way of each other, or are too thick for their general appearance, they should be removed entirely; but this may be continued so as to prevent flowering altogether, so that when the plant has become moderately bushy, all the shoots should be allowed to go up to bloom, and that without forcing, or heat of any kind, but merely protected from the weather by a frame and glass, and allowed all the air.

DWARFING LARGE SPECIMENS WITHOUT STRIKING.

We cannot prevent large plants from growing to a considerable height, but we can at least check them a third of the elevation they would acquire in an ordinary way. The pots which have contained the plants of last year are at the close of the bloom placed in winter quarters, and the plants are cut down to within a little of the soil. In the spring, when these begin to grow, they should be turned out of these pots, trimmed, the top

surface of the soil taken away, pots a size larger should be procured, fresh drainage and fresh soil applied to the plants, the soil pressed well round the ball of earth, which if much bound should be loosened; the whole should be well watered to close the earth about the roots, and the pots should then be replaced in the pit or frames they were in before; these plants will in general throw up more shoots than are wanted, a selection of the strongest and best should be made after they have grown up a little, and all the lanky ones should be removed altogether. As they all advance they may be allowed to grow until the earliest cuttings are wanted, and the strongest shoots may be topped for that purpose. The length to which the shoots are shortened should be different; and in proportion to their strength the strongest should be left a good deal longer than the weakest, because they are capable of supporting the greater number of lateral branches, but the tallest should not be more than six or eight inches high, and the weaker ones not more than half the height; they may now be put out of doors, in the same way that young plants are, in the shade a little, and watering must be attended to. These plants will be considerably shorter, and more bushy in their habit, and bear a great many more flowers. But there is no way of producing the Chrysanthemum so well, so elegant, in such good colour and condition as to foliage and flower, as that of taking the tops of the shoots at different seasons, and growing them without heat.

CHRYSANTHEMUMS FOR SHOWING CUT BLOOMS.

The system of culture for growing the best show blooms to cut, must be totally different from that which we have recommended for showing the whole plant. In the one case we want to exhibit a handsome bushy plant, with as many flowers as it will carry well and bring to an ordinary size; in the other we care nothing about the plant, and only want an out-sized bloom to be cut off and shown in a stand. For this last purpose select a few of the best sorts, strike a portion in autumn, and another portion in early spring, in thumb-pots; as soon as the roots reach the side change them to large sixties; when the roots fill these change to forty-eights. All the while they are growing keep them out of doors in a sheltered situation and tied up to a stick but not too tight; when their roots have filled the forty-eight sized pot, prepare the blooming-pots, size sixteen; let there be a good two inches of crocks at the bottom and prepare a good rich compost, one-third good loam from rotted turfs, one-third turfy peat earth broken small, one-third well-rotted cow-

dung, or dung from an old melon bed; let this be well mixed and laid together a little while before using. When you shift, put upon the crocks that are for the drainage as much soil as will make the top of the ball of earth even with the top of the pot, and having taken the ball out whole with the plant undamaged, fill up all round with the prepared soil, pressing it down between the ball and the pot. Take off all the side shoots all through the culture, from the time the cutting is first struck till the period of bloom. When the plants are shooting up pretty strong, take out the small stick to which they were tied, put regular carnation sticks and let them run up in the same way, be ready with the same kind of shade as the carnation. Besides having these in pots, plant some out of doors, but do not let the side shoots grow, and in other respects treat them as if they were in large blooming-pots. When the buds show themselves, reduce them to the best two, and as soon as you can determine which is the most likely to answer your purpose, remove one of these, that all the strength may be thrown into one flower only: the plants in pots should be put into the greenhouse, or for want of that into a deep pit, or even into a dwelling-house, as soon as the weather becomes uncertain, because, as there is no succession of blooms, a frost would settle these altogether. Those in the ground may be bloomed upon tables like the dahlia, and covered with flower-pots in the night and during bad weather; the bloom when once opening will not be improved by rain, nor by the sun when it is too powerful, but covered over during the bad weather, and in the night, there may be a tolerably sharp frost without injuring the flower, and the plant stands a good deal of rough weather. Those who grow tulips under an awning will find the frame closely covered, protection enough for pots, and on taking the tulips up in June, the bed itself would carry the chrysanthemums to a very good bloom, if they were planted out a foot apart, the dwarf ones outside, the taller ones in the middle; but only one shoot must be allowed to grow, and all the side shoots from that must be removed as fast as they grow. In the middle of September the side-cloths must be put up, and the top-cloth be put on, that they may be all made close in case of frost, and every night. They will have done their bloom in time for the tulips again, for as there is but one bloom, or two at the most, they will come earlier and be done with by the first or second week in November, which is time enough for the tulips. Those in the house will come the finest because they will have received no check. Those in the open ground will, however, do well, and the lot flowered in the tulip

bed, will, if well arranged according to their heights, in five rows, a foot or a trifle less apart, form quite a handsome object during the greater part of October. If, however, they are not to be cut, but merely bloomed as a collection, three blooms may be left on each, to last so much the longer in flower. Chrysanthemums are packed for showing the same as dahlias are, in tubes, with the stems through a stopper made of wood, cork, turnip, or potato, and so kept from bruising their under leaves by the height of the stopper, above the stand in which the tube is dropped, or sometimes fixed.

PROPERTIES OF THE CHRYSANTHEMUM.

We expect a sort of remonstrance against the properties which we shall set down as desirable in the Chrysanthemum, because the forms of the present varieties are as numerous as were those of the dahlia when the published rules first set to rest the properties of that universal favourite. There were among them at that time anemone-flowered, China-aster-flowered, globe-flowered, single, and *semi-double*, flat, starry, and ragged flowers, to say nothing of colours. In the Chrysanthemum, we are told in a very recent publication, that there are the ranunculus-flowered, the incurved, the China-aster-flowered, the marigold-flowered, the clustered, and the tasselled, all of which, except the ranunculus-flowered, are untidy and flimsy. Great efforts have been made to bring these flowers into notice, and shows have been established at which the judges have not known by what rules to award the prizes, or which flower was the best. We affirm with great submission to those who pride themselves on this flower, that it is impossible to select one less fit to exhibit, cut from the plant, and that individually there is nothing to hope for in the bloom itself that should raise it to the dignity of a florist's flower; but as there is great merit in growing the plant well in pots only, and as the plant is showy when there is a scarcity of bloom in a house, they ought always to be shown in pots only, and the merits of the plant be taken into account quite as much as that of the bloom, and as such we shall notice both.

1. The plant should be dwarf, shrubby, well covered with green foliage to the bottom, the leaves broad and bright, the flowers well displayed at the end of each branch, come in abundant quantity, and be well supported by the stems.

2. The flower should be round, double, high in the crown, perfect in the centre, without disk or confusion, and of the form of half a ball.

3. The individual petals should be thick, smooth, broad, circular at the ends, according

with the circle of the flower, the indentations where they meet hardly perceptible.

4. The petals must not show their undersides by quilling, and should be of such firm texture as will retain them all in their places.

Size of bloom to be large in proportion to the foliage, but the size only to be considered when plants are in all other respects equal.

The properties we have described bring a good flower under one of the two classes, ranunculus-flowered, or marigold-flowered, and therefore we pronounce the tasselled, the quilled, the incurved, and all ragged and confused varieties, as well as all those which exhibit a disk, to be inferior to the other flowers in all the points in which their deficiencies can be recognised, and sincerely hope that there may in a few seasons be a sufficient number of good ones to enable us to banish them altogether as show flowers.

A FEW OF THE BEST CHRYSANTHEMUMS.

A society has at length been formed in the Metropolis for the encouragement of this autumnal visitor, and we have been gratified with a sight of Chrysanthemums as large as medium-sized dahlias. The capabilities of this flower are but little known by ordinary dealers; for we have been to the advertised collections of Messrs. Chandler, said to be the best, and we are bound to say that we there saw nothing to tempt us to grow the Chrysanthemum, except as an out-of-door subject to prolong the lively appearance of the garden after the dahlias are over. The lanky branches, only half furnished with discoloured leaves, even in the best we saw, rendered them very ugly in pots, and those who do not see them grown as they may be grown, will not be tempted to adopt them as a stock flower in collections. Since the properties of the Chrysanthemum were laid down a few years since, the foreigners appear to have chosen their new varieties better, and there are some approaching the standard. As a proof of the difference between well-grown and ill-grown specimens: we had made a descriptive list for the purpose of publication from the collection at the Vauxhall Nursery, and after attending the show of the Chrysanthemum Society, held at the Rochester Castle, Stoke Newington, we threw our list into the fire; we will give a specimen of the discrepancy.

THE CLUSTERED YELLOW. — "Bright yellow, flowering in clusters, with soft quilled petals, standing out like irregular rays; these in some places thick; in others thin, so that the flower never forms a circle; hard, confused eye, with petals undeveloped; abundant bloom."

Perhaps the above description, taken honestly from scores of plants at Vauxhall, is as unjust

as could be written; but it seems that the Chrysanthemum, like many other subjects, wants more care than nurserymen will bestow. Clustered yellow was in all the winning stands, and there were many pots of it besides, and our description from well-grown specimens would be thus:—

CLUSTERED YELLOW.—A noble round bright yellow flower; very full on the face with exceedingly good centre petals, inclined to cup, and altogether one of the best show-flowers, according to the properties laid down.

GOLIAH, another grand flower, was exhibited, as large as a middling-sized dahlia. The petals of this flower curl upwards and turn over inwards, showing the back of the petal, but very uniformly closing into as splendid a bloom as ever we saw, forming almost a cone, but rounded. The colour is pale, but it is darkened gradually on one side, like an apple or other fruit; the shading is so gradual though it deepens. The centre of this flower is good, though made up as it were by the curling petals meeting in the middle. We are quite within bounds in saying that Goliah was four inches across, and beautifully formed, the outline as true as a drawn circle.

TWO COLOURED INCURVED is a noble flower, the front of the petals one colour, the back another, and all the petals sufficiently incurved to show the backs. The face is rather hollow, but it is a bright-looking flower in a stand.

One of the neatest and best formed of all is **ANNIE SALTER**; a small flower, bright yellow, with reflexed petals, laying well, and forming two-thirds of a ball. There is nothing among the whole tribe so completely a show-flower as this little pet, though it is very small compared with many favourites.

Most of the Chrysanthemums in present cultivation, even the best, have curled, or, as they are called, incurved petals; generally loose and irregular; but there are a few and very few, that make up well, that is to say, that are symmetrical when full bloomed, and form a sort of half-globular flower, close enough to pass well in a stand. The publication of the names of these will give our Continental friends a good notion of what will pass current among florists; and we strongly advise all who intend to commence the cultivation of this flower, to confine themselves entirely to those we mention until they see something better, for the descriptions now publishing are altogether false, and we in vain, in a very large collection, sought for more; we proceed, however, to describe them.

CAMPESTRONI, purplish red, very full, tolerably round; a good full size, showing the dull underside of the petal by reason of its curling, the centre full of petals, but sunk.

BEAUTY is after the fashion of Goliah, but not so compact. The flower forms well, because, although the centre is thin, the petals curl over, and make up a nice globular and somewhat rich-looking flower.

KING is blush pink, curling like others, but making up into a showy, bold, round, good flower; centre pretty round, and general appearance rich.

ARISTIDES is a fine orange-coloured medium-sized flower, very bold and full, desirable on account of its being the best of its colour, and showable.

DEFIANCE, large white, forms a good round flower by the petals curling inwards, so that the outside of them is shown; the petals are not so thick as some, but the style is very pretty.

LUCIDUM, a blush white; made up much in the same way by the petals curling inwards; full-sized, and very pretty.

FORMOSA is also a very pretty white, but not so large as some others; forms a nice globular flower, although the petals are not so full as many of the sorts.

These few are all that we should grow of the great number we have seen, and all we should recommend others to grow. There may be some new ones to come out in the season, and one especially that we at present do not know the name of, but which we mean to recommend to make up a dozen. It is of no use recommending a parcel of misshapen flowers that present no good qualities. It is wasting ground, and pots, and house-room to cultivate them. As, however, there are some who may wish to buy less than a dozen, the principal object will be to judge from the above descriptions which are the best, regard being had to diversified colours. The general management of the Chrysanthemum for the year round may be thus laid down:—

JANUARY.—In this month most of the flowers will be gone, and the plants may be cut down to within three inches of the pot, and placed in the pits, where they can be covered up, or plunged in rows in the ground, to be hooped over, or covered with dry loose litter. Those which have not done flowering should have decaying blooms removed as fast as they decline. If the soil has wasted in the pots so that they are not full, fresh earth may be put to fill the pots, as the earth is some protection to the crowns of the roots, and it prevents water from lodging in the pots.

FEBRUARY.—Continue as in January, taking out and providing for the bloomed plants, protecting against hard weather: the pits, or frames and lights should be left open, and the plants on all occasions uncovered in mild weather.

MARCH.—The balls may be turned out of

the pots, the top surface rubbed off, some of the spent mould shaken out of the roots, which may be slightly trimmed, the plants repotted in the same size or larger pots, with fresh compost, new drainage, and so forth, and may be replaced where they were taken from; only remember that when plants are plunged, the hole in which the pot is placed ought to be carried down lower than the bottom of the pot, narrow enough to prevent the pot from going down, but sufficient to hold the water which runs through the pot, instead of preventing its egress, which would be the case were the pot fitted to the solid bottom.

APRIL.—The shoots come up thick now, and those who propagate for sale take them off as fast as they come, and continue striking them under a bell glass in sand and soil, and with a little bottom heat; rub the glass dry every morning inside; shade the cuttings from the sun by means of paper which does not exclude the light. Those plants which are to be grown for specimens are not to lose any of their tops, but may have all superfluous shoots removed to strike for young plants. Continue protection through the month, and when necessary give them moderate waterings.

MAY.—The plants may now generally be examined and removed to a sheltered and shady place, where they are to make their summer growth. You may continue to remove superfluous shoots and branches for propagation, and strike them as before directed. At the end of the month some of the struck cuttings may require potting off, and they should be continued in the heat they were struck in until the plants have recovered their check. You may begin now to trim the large specimens, leaving no more main shoots than you require.

JUNE.—Topsome of the longest of the shoots, but not generally, as July and August cuttings make shorter and better plants; but, where quantity is required, we cannot be too much upon the alert; strike them as before. Pot off struck cuttings, and those which have become established and got over the potting may now be placed out where they are to grow; some may be left to grow naturally, others may have the tops taken off to throw out laterals. The large ones must be looked to and treated as required; if they are to be grown as specimens, they must be shortened and trimmed out; if destined to supply late cuttings for dwarf plants, they may go on growing. See to the watering, which must never be neglected with growing pot plants, because they dry rapidly.

JULY.—Take off more cuttings from the tops of the strong shoots of the plants left for the purpose, and strike them as before. Pot off all those that are struck, and shift some of the earliest that have filled the pots with roots.

Give also all the specimen plants a shift, if they have filled their pots with roots. Look well to the watering; top any of the small plants intended to be made bushy; and place out those plants which have been potted off and have recovered themselves.

AUGUST is a continuation of the same events, and, therefore, requires a continuation of the same treatment as that for July. Take off the last cuttings. Let them be from the tallest shoots, for they will, in the end, make the shortest plants. Strike them with great care and attention, because they are naturally the most obstinate. Pot off struck cuttings; shift plants which have filled their pots from one size to another; and look well to the specimen plants, which require thinning out, topping, removing, or shortening, the growing shoots to give something like symmetry to the plant. So with the young ones. If they are not growing handsome, and are getting lanky, shorten them also, always excepting those to be grown naturally, but from cuttings; tie up the specimens out of doors. Plant out some in the open ground.

SEPTEMBER.—Some of the plants are indicating flower, and all have, by the end of this month, come pretty well to their growth. Now they must be taken to their several places, according to their purpose, some into a warm greenhouse to bloom, and be drawn up, and spoiled; some to the conservatory, to figure among the few autumn flowers; but the mass to cold pits, where they are protected from frost, but can have all the air in mild weather, even by the entire removal of the glass all day. In all their stations they will require occasional watering; fasten any of the loose shoots of these in the open ground.

OCTOBER AND NOVEMBER is a mere continuance of their approach to, or their completion of bloom; and they merely want the same treatment. Some apply liquid manure to them instead of plain water. It is a wrong notion, spoiling the texture, the colour, and the endurance of the bloom.

DECEMBER.—The bloom of the early ones begins rapidly to decline; and, as this occurs, cut down the plants, and remove them into cold pits, or plunge them in the open ground where they can be protected by hoops and mats, or litter. See that the place be well drained, and have the pots filled with compost, that no water may lodge. Keep off the heaviest rains, if possible. Those in the open ground may be flowering half through this month, if the weather has been mild; but when the frost finishes the bloom, they may be cut down and cleared, and left to take their chance, or be covered up with rough litter. All the plants are to be removed from their various flowering places to their resting quarters, and be tended during

the rest of the winter as plants at rest ; very little water, very little care, an occasional inspection to see that the draining is clear, is all they want.

MANAGEMENT OF GARDEN ALLOTMENTS.

THOSE who will allot ground to poor cottagers at a moderate rate are real benefactors ; and those who are ignorant of the means by which ground is made profitable should be instructed by a supply of some plainly written book, that they may read, or have read to them, or, to make the work of benevolence more complete, they should be instructed. Economy in the management of an estate turned into allotments is a first consideration, and were we to attempt anything of the kind we should do it effectually. Let us first consider, then, what is necessary to a garden ? First, good ingress and egress by well-made paths and roads ; second, a supply of water within reach. We will suppose fifty acres of land to be adopted, from its situation, for the use of the cottage population of a village or town, and that the ground is worth 3*l.* per acre as a rental. To this fifty acres of land there should be a road or roads, so that there might be no difficulty of approach in bad weather. The number of allotments should be two hundred, which would allow of forty rods to each person, and the holding should be limited to the forty rods until a man could show the managers or the owner that his family was large enough to render him a proper object for more. The forms of these allotments should be, as near as may be, ten rods long and four wide, and as many of them squared properly as the form of the entire space will allow. Of course, some will be worse than others. We would have a range of pig-styes in the most convenient part, for the purpose of being let at a trifling rent to such allotment holders as choose to keep pigs, that they might have on the spot the means of using their waste profitably, and supply themselves with manure. There could be no difficulty in this arrangement, and many ways there are of carrying it out. On these fifty acres there should be placed a creditable man, whose cottage should overlook the whole plot, and who should have the following duties to perform :—He should keep the public roads in order, that is to say, the main roads that lead to all the allotments, but not the private paths ; he should be an inspector, to see that each allotment holder does not damage or infringe on his neighbour, or commit any nuisance, or suffer weeds to seed in his ground and blow over other people's ; he should collect the rents weekly, and keep a record of all the occurrences of note ; he should keep a supply

of appropriate seeds, purchased wholesale by the managers, and retailed at cost price to the holders ; and he should be in authority, as constable, to apprehend any trespasser or person committing wilful damage ; he should also keep spades, rakes, hoes, and other useful garden tools, bought wholesale and sold at the cost price to the allotment holders, or for a weekly payment instead of money down. We reckon this office at a cost of 20*s.* per week, or less, including his rent. So that let us charge the roads and repairs, and the providing of proper wells or supplies of water at 1*l.* per acre, the overseer at 1*l.* per acre, and the land 3*l.* per acre. Let the charge for each allotment be 6*d.* per week, or twenty-six shillings per annum for each quarter of an acre, being at the rate of five pounds four per acre. The effect of allotments like these would be like magic on a rural population ; for it cannot be denied that in too many cases the prices have amounted to extortion. Five pounds per acre is enough, in all conscience, for a poor man to pay ; but in scores of places there is more than double the rent charged ; in some places it has amounted to twelve pounds per acre. Here we have the means of providing two hundred poor men with each a garden large enough for his family purposes for sixpence a week ; and it should be the study of the managers to draw up such rules as might prevent the holders from extravagance or waste by restricting them to the articles they should grow. These rules might extend to an obligation to grow so many rods of potatoes every year, and no more, because the first object should be the ensurance of food for the family, and preventing them from growing too much of a lazy crop. A few stringent regulations as to the disposal of so much of the land in useful food, and judicious restriction of the quantity that might be used for flowers and useless or extravagant crops, would be as necessary to the well-being of the holder as the land itself. Suppose there were none, a man naturally idle might plant all his plot with potatoes, leave them to take their chance till earthing up time, and then leave them till the time for taking up, when, having more than he can possibly use, he would have to sell them, and the money might possibly be expended badly ; whereas, if he were obliged to have different crops in about the proportion that families consume vegetables, he would be obliged to work at his garden continuously, and provide wholesome changes in the vegetable diet of his family, and sell the surplus if he please. We have especially mentioned potatoes, because we should not like to see our rural population become lazy. Ireland gives us too fatal a result for us to adopt potato culture as the

dependence of our working classes. It has been, in our opinion, the ruin of the people there, as far as the total prevention of honest industry can be so called. If a family there could secure a piece of ground planted with potatoes, and take up the crop, it was all they cared for, the labour was nothing; the crop was their food, and so without any incitement or encouragement to work, and enough potatoes to keep them from starving, they were alike reckless of every thing beyond the mere possession of their store to last the season. The failure of their crop, therefore, was the failure of every thing. To find them labour and pay them well for it was forcing them into active exertion, which they could not brook, and making them work or starve; this unfortunately put the whole population out of the way; their discontent was manifest,—their idleness a downright firmly-rooted vice. They would understand nothing in the way of relief except finding them food, while they indulged, as heretofore, when their pits were full of potatoes; and unless there were certain restrictions in the mode of cropping, the allotment of land among the rural population of England might in some degree awaken notions by no means beneficial to their morals or their social condition. There is as much to guard against in one extreme as the other. Give the poor gardens that shall enable them to use their over hours, and by means of increased industry procure a greater plenty of good wholesome vegetable food, and you teach them the value of labour by the double operation of profitably filling up their leisure time, and keeping them out of some other, and in all probability costly occupation. Nothing in our experience tends so to demoralize men as idle time on their hands: the mind must be amused; the less mind a man has the more easily is he induced to go astray. What is the ordinary consequence of a man coming from his daily labour with three hours daylight on his hands before bed-time? He and his companions, with no profitable object in view,—nothing to tempt them to advantageous occupation, go and take—we are putting the most favourable construction on the thing—go and take their social pipe and pint of beer at the ale-house; suppose this to be done, and no more, the man has expended at the week's end one shilling for beverage in which his wife and children participated not, and goes home to bed to get up to his daily labour in the morning and repeat the same in the evening; so that instead of adding one iota to his resources by the three hours of his own time, he uses them to lessen his income, if nothing worse. But suppose—and this applies to a large portion of the rural population—suppose the mind is a little more active, and wants a little

more excitement,—suppose there are games at skittles and bowls, and quoits, and other more objectionable gambling going forward, and he mixes with the throng, it is not one nor two pints that will do, and the Saturday night is a painful one to the mother and children at home; suppose half the wages have gone to pay the ale-house score, and suppose the frugal shilling laid by for clothing by the frugal housewife is missing, and we gradually see the poor creatures worse clad and worse fed: what, then, becomes of the man? He does not improve while he has three hours of idle time on his hands. He gets from bad to worse; he begins to see griping poverty at home. He has seen enough to feel acutely now and then the mischief he has done; but, with no path pointed out for him, and no apparent means to recover himself, he flies to the ale-house to dissipate the gloomy picture, and makes bad worse; perhaps joins some society of poachers, and tries to get by these means something to make up for the money spent in drink. One step only from poaching to less equivocal robbing, and the man is lost. How to reclaim the thousands of this precise character is worth serious consideration. Offer him an allotment, as in some places they do now,—he has no tools, no money for seed, no means of starting fair. Hence the necessity of adopting a system. Let the same power that provides him with a quarter of an acre of land at sixpence per week, provide him with his proper tools, seeds, and other necessaries, at sixpence a-week more till they are paid for, and *the man is saved*. He will fly to his garden, and feel it the greatest relief; he will feel the good effects in an incredibly short time; he will lay down on his pillow fatigued,—but to lay down with a quiet mind after fatigue is one of those luxuries which are valued by all who can enjoy it; and who can so well enjoy it as those who have been previously in the habit of going home to a wretched wife, to ragged children, to an empty cupboard, feverish with drink, but nevertheless sensible enough to be cut to the heart by the sighs of his neglected helpmate? Yet thousands of such men are allowed to go step by step to infamy and perdition for want of considerate superiors. All men have to pay some sacrifice for the preservation of the bulk of their property. They pay for a watchful police; they pay an insurance premium to save themselves in case of fire; and if the landed gentry in every town would devote the most favourably situated fields to give the humble population the benefit of a garden, they would be preserving in the most effectual manner the rest of their property. They would not be called upon for so much poor-rates; they would protect themselves better than the police can protect them

from continual petty depredations : but there is one consideration that is far beyond all others ; they would be saving their fellow-man from being totally lost in this world and the next. All we want to impress upon the minds of those who wish to adopt the system effectually is, that they should have an overseer who should be a practical gardener, living in a cottage on the spot : that, among other duties such as we have spoken of, he should be obliged to teach the holders the handiest and best way of doing things, when they were manifestly ignorant of it ; that he should be provided with all the necessaries for the holders of allotments, to be sold to those who want them, at the cost price, and take the money weekly with their rent. This would be effective benevolence, and the fruits would be manifest in a rapidly improving neighbourhood. With regard to the nature of the restrictions as to crops, something must depend on locality and the habits of the people ; generally speaking, half the ground in potatoes should be the maximum, a quarter the minimum ; they should never be allowed to plant potatoes two years together on the same spot. Half the ground should be the maximum for wheat ; but there should be no obligation to sow grain. The other crops should be carrots, cabbage, lettuce, celery, spinach, onions, and other vegetables ; but there should be a restriction as to the quantity of any one thing, because the object is to make them provide well for families, and not be extravagant. Fruit should be restricted to the useful ; not costly fruit for sale. The object is not to create market-gardeners, but to make happy men and happy homes. We are quite certain that if anybody, no matter who, wishes to make the allotment system effective, all these precautions are necessary. The first step is to lay out the ground, and see it drained properly, and the necessary roads made, so that a cart can get to every garden. This may require a little consideration and skill, but the first expense is always the best ; employ somebody who knows his business, in the onset, and all will go well. If the thing be a parochial affair, all the labour can be had from the workhouse and distressed out-of-door paupers ; the cost therefore will not be much. This once done, and the plots marked out, there can be no difficulty ; and we suggest that, to prevent any squabbling between the holders about boundaries, a common path should part all the pieces, stakes being driven down the centre and level with the surface, each being bound to keep eighteen inches clear path from such centre, but the path to be in common for both to use all of it—three feet being wide enough for any purpose. There are many regulations that may be required for particular

localities, but of these we can say nothing ; and the laying out of the ground must depend altogether upon its situation, drainage, probable supply of water, and other circumstances. But every parish should, for its own sake, have a piece of land to allot, and it should be very different to the best we have yet seen. In no one have we seen proper roads, proper drainings, proper supply of water, or that which to our view is indispensable, an inspector or superintendent. In no one place do we know of a proper, economical, and attainable supply, upon easy terms, of the seeds, tools, and necessaries for cultivation ; and to these points do we earnestly call attention. Our notion of the amount to be charged for rent may be questionable in some localities, but our notions of the proper management of such establishments cannot be. And now we come to the last, though not least important, part of our arrangements—the periodical show of productions. There ought to be premiums awarded. Award first for a certain number of the best managed allotments ; for the best potatoes, carrots, cabbages, onions, savoyas, lettuces, peas, beans, beetroot, and useful vegetables only ; none for asparagus or sea-kale, or forced things of any kind. The judges should be authorized to award premiums for any new variety of anything raised on the ground, and for any ingenious contrivance in implement or practice that should be considered deserving especial notice ; and the produce of the day should be sold on the day of show, to the highest bidder, for the benefit of the owner. We can imagine that some will be deterred from adopting any such system by the apparent trouble and difficulty ; that others will think, as too many do now with existing allotments, that as long as the parties have their ground marked out, they may as well make the paths themselves ; and that as to draining and so on, it is expensive. But what is the use of setting men to work unprofitably ? Why set them to overcome evils, when they ought to be enticed by all the advantages that can be offered ? Let any considerate person weigh well what we have recommended, and then go to any existing set of allotments, and think which is the more likely to prosper. We have read a good deal, and seen a good deal, of allotments, and the present system of granting them, and their general management, but they are all full of objections. A vast deal of good lost for want of system ; a large portion of labour wasted because wrongly applied ; and all this for want of a good beginning. Every plot should be well defined by made paths, the centre of which should be the boundary, because there is no excuse for disturbing it ; the whole well drained, that the ground may be made really productive ; the

whole approachable by good roads, to save labour in carrying on the proper dressings and bringing off the matured crops; and the whole watched, kept in order, supplied, and the rents collected, by a man always on the spot. This is the way to make allotments useful to the holders, beneficial to the neighbourhood, and, above all, important to all interested in the moral and religious improvement of the working classes.

THE DAHLIA, AND ITS PROGRESS.

AMONG all the flowers that have been noticed by florists as show subjects, none have attracted more attention than the dahlia; yet the really improved varieties do not amount to one-tenth of the number sent out under warranty as show flowers. The present year actually affords little or nothing in the way of advance, and yet we have several praised by the newspapers as grand acquisitions. Anybody who reads Mr. Glenny's description this year, in the Almanack for 1848, will scarcely fail to observe that he has confined himself to descriptive particulars, and has altogether abstained from recommendation. Let any one who grows the dahlia for exhibition read these descriptions quietly, and judge calmly, and see whether there is anything to tempt him to buy. We have a flower of Mr. Whale's, held up certainly as the crack flower of the season, and it is just possible to be so. The only time it was shown, to our knowledge, it was falling to pieces, but there was the remains of a noble and beautiful flower. It was a pure white, a beautiful outline, handsome rounding face, compact well-formed petals, laid as symmetrically as possible; but the inference drawn by growers when a thing is seen but once, and then seen badly, is that it is uncertain. This may or may not be, for some men care little about prizes at country shows, and will not take the trouble to show at them. Mr. Whale generally confines his exhibitions to the metropolitan and the Salisbury shows; so that his *Delight*, though only seen once, and in bad condition, may nevertheless be as certain as most flowers; and if so, it is a splendid variety, an improvement on all the edged flowers. However, going to the merits of the present year's dahlias, we are directed to *Gem* and *Shylock*, as two grand acquisitions, whereas we maintain that (even allowing all Mr. Glenny says of them to be true) neither of them beat flowers in the same way already in our collections. Mr. Glenny says of *Shylock*, that it is "rather coarse," that the petals are "large," and that the "outline is not perfect;" all of which is perfectly true. The outline is a sort of rosette,

instead of a circle; and we aver that *Scarlet Gem* is worth a thousand of it. *Shylock* is a good flower of the old school, and it is, moreover, a certain flower; it is in scarlets (supposing it were a good scarlet) what *Essex Triumph* is in darks; *Berryer* beats the one, and *Gem* the other, as completely as *Springfield Rival* beat all its predecessors. But a certain flower is sure to be in more stands than an ordinary one, though it were twenty degrees worse. Though we insist upon it that *Gem* and *Berryer* beat completely in these two classes, let us be understood not to object to *Shylock* as a new flower; but the extravagant praises bestowed on it proceed either from interested, or from ignorant, or from inconsiderate people. *Gem* is a style of flower that we have had various grades of; the *Maid of Bath* was the coarsest, the *Bridesmaid* was better, and the *Marchioness of Ormond* better than *Bridesmaid* and all in the same way; but they were so dreadfully treacherous and uncertain that many discarded *Bridesmaid*, and nearly all threw the last away; nevertheless, both were better flowers when perfect. We do not, however, object to *Gem* coming out as a new flower; it may be useful, but it is not a jot better than *Lady of the Lake*, *Miss Vyse*, and some other light flowers; it deserves to come out, but it does not deserve the praises lavished on it by the newspapers. It is, as Mr. Glenny says in the almanack, "rather coarse;" which, when we look to such flowers as the *Standard of Perfection*, *Sir Robert Sale*, the *Queen of Roses*, and others that come in the style of a ranunculus, and almost form a new race, is a fault not to be lightly treated. We do not object to the dealers themselves describing a new thing in flying colours,—it is natural they should make the best of it; but we protest against the praises of needy adventurers who are employed on journals, being received as any authority, when the facts before us show that they assert of flowers what is not true. In the list described by Mr. Glenny, who is usually looked up to, he precedes the description by saying, "We have no first-rate varieties to report." We read the descriptions carefully, and believe they are just, so much so, that people who read may suitably make up their minds what they would buy. If we could only buy one from his description, it would be *Delight*. If we could stretch to half-a-dozen, we should add *Shylock*, *Queen of England*, *Gem*, *Walter Hilson*, and *Lady Ashley*. And if it were to be pushed to a few more, we should add, *Fire King*, *Jane*, *Forest Flower*, *War Eagle*, *Boule-de-feu*, and *Attraction*; we mean that this would be our conclusion from Mr. Glenny's descriptions. *Nell Gwynne*, *Canary*, and *Mont Blanc*, we take to be among the

last on the list, chiefly on account of their colour, and having no particular redeeming point. With Mont Blanc, Canary, and Nell Gwynne may be placed Yellow Perfection, Sir Robert Peel, and Richard Cobden. It was, however, quite right to describe all these, because they have all been conspicuously shown, and many of them cried up too much for the price to be honest, and the public are glad of a fair and fearless opinion. But we should feel more inclined to take the growers' recommendation of things that have not been seen, than to come down too low in Mr. Glenny's scale. If he has not seen one-half that are to come out, there may be some good ones in the back-ground; still there are enough among those described to do for moderate growers, and as such the almanack will, after all, be chiefly looked to for the directions what to buy. Fancy flowers have, however, taken a fair start. Mrs. Shaw Lefevre is one of Mr. Glenny's pets, he expresses no doubt; it is "dull red and white, but splendid form, and a great favourite." This is distinct then, and no mistake: Jenny Lind a second, Jeannie Deans a third, Belted Knight a fourth, Eliza Meilez a fifth, because it is lugged in by Mr. Glenny in a postscript; but we should depend on the sheet almanack more than the book, simply because it is published two months later. We have, however, seen several circulars, but the principal object of this paper is to show, that unless some one who can be depended on will give us fair descriptions, it is impossible to be at all prepared for the overwhelming lists of new subjects from which men of limited means have to select not more than half a dozen or a dozen; but we positively assert, that among those Dahlias which the public have an opportunity of knowing, or of which they have been able to read anything to be depended upon, there is not one advance among the show sorts, unless it prove to be Delight; the others are, according to the best authority, not first-rate. But the following may be had for their several qualifications. We may say, however, that the fancy kinds are advancing, for they are becoming of a good

Delight, for its form and beauty.

Shylock, for its constancy and high centre.

Queen of England, for its rich colour and novelty.

Gem, for its deep tip when in good order.

Walter Hilson, for its brilliant orange.

Lady Ashley, for its compactness.

Fire King, for its dazzling orange-scarlet.

War Eagle, for its deep red and constancy.

Boule-de-feu, for its general usefulness.

Attraction, for its rich colour and shade.

Forest Flower, for its thick petals and dense lilac.

Jane, for its usefulness as a light flower.

And these may be taken almost in the order we have placed them. According to the number wanted, people may begin at the top, and come downwards. Then, as to fancy flowers, they appear to stand upon their merits equal up to five, and we would add a sixth:—

Mrs. Shaw Lefevre, for exquisite form and distinctness.

Jenny Lind, for richness of colour and general form.

Jeannie Deans, for general form and new colour.

Belted Knight, for novelty of colour and good form.

Eliza Meilez, for its splendid form and rich colour.

Lady Sale, we would add ourselves.

We believe much good will result from the new Seedling Society encouraging the raisers of new varieties of every thing, for it will lead to the assembling of all classes of gardeners, and the consequent temptation of many to try upon fresh subjects. A market-gardener, for instance, who joins it for the sake of the new fruits and vegetables introduced, may be easily tempted to grow a few rods of seedling dahlias, and a greater chance of producing novelties than many who have, year after year, been sowing seeds carelessly, and planting thousands with far less chance of striking novelty, than the new man who sows seed from a dozen first-rate kinds, and plants out only hundreds. At all events, there is nothing this year that can be called an advance. Mr. Glenny speaks of a new flower of the present season, of which only one bloom has been shown, "The Maid of Kent," and if there was the least dependence on its constancy, it might be a star, but we are in doubt about it. The make of the flower is similar to Princess Radziville, and if it be one-half so certain, it will be a valuable addition. There is one variety this year, also, of which we can say but little, because we have seen but little; we allude to Yellow Perfection; we have only heard of two blooms being seen, one good, the other middling, and the flower is two years old, so that there ought to have been more; a single plant ought, if at all certain, to have yielded four blooms for the Surrey Gardens, instead of one, because they are not all obliged to be perfect, and a good judge of a flower cannot be prejudiced by three of the four being out of condition. The one bloom, however, fully justified the name, it was a neat, compact, well-formed flower, and if it be at all constant, may become a great favourite. Any who buy it purchases a ticket in a lottery, that may come up a prize or a blank; if a

prize, it will be a good one, because there cannot be many made from the very small stock in existence. Upon the whole, then,

we come to the conclusion, that there has been very little done to improve collections beyond adding to the variety of "useful flowers."



CULTURE OF THE IXIA AND ALLIED PLANTS.

IXIAS are among the most handsome of the smaller greenhouse bulbs; but, notwithstanding this, they are but rarely met with in cultivation. This cannot arise from any real difficulty in growing them, for they readily submit to cultivation, and only require peculiar attention as to their growing and resting seasons: doubtless it is referable to that popular prejudice by which familiar forms excite a less degree of attention than those of a more novel character, for some years since these plants were more frequently to be met with; or it may be that gardeners, at that time, were not so generally impressed with the importance of affording to all plants—and bulbous ones especially—a season of repose, and, in consequence, were not so successful with these plants as they might have been.

Ixias belong to the natural family of Irises (Iridaceæ), and to the Linnæan Triandria Monogynia. The name is said to be derived from *Ixia*, bird-lime, in allusion to the viscid nature of some of the species. They are all natives of the Cape of Good Hope, whence bulbs are annually imported: it is said that, in company with other plants of a similar nature, which form the greater part of the vegetation in some situations, these plants spring up during the rainy season, clothing

the hitherto barren plains as if by magic, first with a carpet of green, which is soon exchanged for one of gay and varied colours. After the flowering season is past, the plants perfect and ripen their foliage, being assisted to do so by the moisture contained in the soil acting in conjunction with the bright light and heat of those latitudes: the heat of the sun being continued, while the supply of moisture is cut off until the next rainy season, the ground becomes gradually dried, and the plants are ripened off at the same time, the face of the country then becoming, as it were, again a barren waste. This natural mode of growth at once points out what should be the leading features of any course of artificial treatment to be successful in cultivating them.

For the most part they are most conveniently regarded as greenhouse bulbs, not, however, actually requiring to be kept in a greenhouse, for a pit or frame in which they can be sufficiently protected will grow them to perfection. In cases, however, where there is a greenhouse, it usually happens that there are situations, such as shelves and narrow ledges, where small plants of this nature can be placed with greater convenience than if a pit or frame were entirely devoted to them.

We mention this then prominently here, because we shall have occasion to recommend the use of pits as very appropriate and economical situations for them during the period of their growth. *Ixias* may, however, be grown in a warm sheltered border in the open ground.

CULTURE IN THE GREENHOUSE.

We will commence with the bulbs in a state of rest. When in this state they are to be kept quite dry, being allowed to remain in the soil exactly as they were growing. A dry shelf, at the back part of the greenhouse, is a very suitable position for them, when in this state; and they require no other care than to be kept dry until the time of potting them.

The time for potting may depend on circumstances. Where there are more than a very few roots, it would be desirable not to pot them all at once; as, by a little variation of the time of doing this, and of exciting them into growth, a longer succession of flowers will be secured. About the latter end of October may be considered as the general time for potting the roots, and starting them into growth, so as to come into bloom, according to their respective habits, in the April and May following. Some may be potted and excited a month earlier, and others a month later; and although, in consequence of the different periods at which the plants will be making their growth, there may not, and probably will not be exactly this difference in the time of flowering, yet this plan will have the effect of prolonging the flowering period of these gay and beautiful plants.

The manner of potting is thus:—Turn out the dry soil containing the bulbs from the old pots, and carefully separate from it all the bulbs and offsets; the strongest of the roots are then to be selected for blooming; while the rest are to be grown as store-roots to increase the stock, and come in for blooming in another year. The most convenient sized pots to use are five-inch ones, in which three or four strong bulbs, or five or six of but moderate strength, may be planted. Smaller pots than these—three-inch ones—will do for the very small growing kinds, about three roots of which may be planted in them. The roots should be placed at equal distances apart, and near the edge of the pots. A suitable mixture for them may be made by incorporating equal parts of turfy peat soil of a sandy nature and friable rather sandy loam; to this about a fourth of the whole of decayed leaves quite rotted into mould may be added: this mixture should be used in medium state, between wet and dry—*wet* enough to adhere slightly when pressed, but *dry* enough to fall to pieces

again when dropped on the potting bench. The pots must be thoroughly drained, because, when the plants are growing, they require a good deal of water. The bulbs should be placed so as to be about an inch or rather more beneath the surface. When the potting is finished, the pots may be set on any of the shelves in the greenhouse, where they are most out of the way, and here they may remain until they commence growing: when growth is perceived they should be brought to some of the front stages, where they will be sure to obtain plenty of light, and be more within sight.

Very little water should be applied after potting until growth commences, for the application of much water at the time when the bulbs are dormant, especially as it would be during the winter season, could hardly fail to be injurious. What is wanted by the roots, when they are brought under excitement, is a very moderate degree of moisture, increased in quantity gradually as they become influenced by it, and put out roots and shoots; if the soil is in the proper medium state, they will almost derive this supply from it, and especially if means are taken to prevent it from rapidly drying by evaporation, which may be readily done either by laying a flat piece of glass on the top of the pot, or covering the soil with a layer of very slightly damped moss, either of which may be removed if the weather is damp, and the covering appears to favour mouldiness, which will be readily detected. There is another advantage in employing a flat piece of glass besides its preventing the evaporation of moisture: where there are any mice they not unfrequently rout up and even eat and destroy the roots, and this covering of glass prevents these busy little creatures from intruding. By the time it is found that the bulbs are throwing out roots, which will generally, or, at least, ought to, precede the protrusion of leaves, moderate applications of water may be given; and the gradual increase of these supplies, as the plants progress, is all the special attention required until the flower stems are produced. It may, perhaps, be necessary to give a caution, that this gradually increasing supply of water is never to be carried to the point of saturating the soil: this, in fact, should be held as a standing rule in the growth of all potted plants which are not absolutely of an aquatic nature. The stress which is laid upon attention to the operation of watering, as the plants approach a flowering state, must rather be understood as implying the necessity of more and more cautiously preventing the soil from becoming *dry*. In order to secure this condition, more frequent supplies will be needed in the same ratio as the seasons, as well as the plants, progress.

When the flower-stems are produced, the taller growing kinds will require supporting in an upright position by neat and slender stakes, which should be painted of a dull olive green colour, so as to be as little conspicuous as possible: it is not in good taste to have these stakes painted of a more lively green than that of the plants, neither is any other striking colour at all desirable. While the plants continue in bloom, and until their foliage has evidently attained mature growth, the supply of water must be maintained; and though, during the period of bloom, the plants may require to be placed in situations (such as drawing-rooms, &c.) where their decorative effect more than any thing else is the object, yet, as soon as the bloom is past, the plants must be placed in a situation where they will get as strong light as can be secured to them, in order that the elaborative functions of the leaves may prepare a store of organizable matter for the production of flowers in the following year. When this object has been gained, and the leaves indicate a disposition to turn yellow, the supply of moisture must be gradually cut off until they become quite dried up, when the bulbs are to be left embedded in the dry soil. In this state, they may be allowed to remain on the shelves of the greenhouse until the season arrives for re-potting.

CULTURE IN FRAMES AND PITS.

The treatment of these plants, when kept in frames and pits, differs in no wise from that which should be followed out in the greenhouse, except in so far as the situation is concerned. The pit should be one of those—adapted for preserving greenhouse plants—which are capable of excluding frost: it should be quite free from damp, but as the roots will not be in an active state during winter, no provision for heating it need be made on their account; they only require sufficient covering, according to the state of the weather, to exclude frost.

As regards the general management of the pit, through the winter it may be kept comparatively close, being opened a little in fine mild weather, in order to purify the interior. In the spring, as the plants grow, it may be opened a little every day while the weather is fine, but not so much as to chill the plants with cold air; for although they may be grown, under certain circumstances, in the open ground, as will presently be explained, yet, when the protection of a pit is afforded to them, this treatment is altogether incompatible with direct exposure. In cultivating exotic plants of any kind, whatever course of treatment is afforded should be followed out as a

whole, and not mixed up with features which belong to a totally different course. Plants like these, therefore, to which protection has been throughout afforded, should not, at different intervals, be too much exposed. During the winter, if the lights are tilted up at the back a couple of inches, when air is required to be admitted, a sufficient degree of ventilation will be afforded, and in the warmer weather of spring, when the plants are in a growing state, double this quantity would at any time be sufficient.

The plants in pits will be somewhat less subjected to drying influences than those in the greenhouse, and will, consequently, require fewer and more limited applications of water. If, however, the principle of applying water only when the soil appears to be getting dry is adopted, there will be little risk of applying too much during the earlier stages of growth, and subsequently, when a greater supply is required, this risk becomes considerably lessened.

In all other respects, such as potting, affording as much light as possible, resting, &c., the same treatment should be given them as that recommended in the greenhouse.

GROWING IXIAS, &c., IN PROTECTED BEDS AND BORDERS.

Notwithstanding that this class of plants, being brought from climates warmer than our own, requires to have the protection afforded by glass erections, to bring them to perfection, yet they may be grown so as to become very pretty objects, even in the open ground, provided a dry and sheltered place is selected for them, and a trifling degree of protection is afforded them. When grown in this way, however, they do not spring up or bloom at the usual period, but just start into growth as the genial weather of spring excites them, and flower under the influence of increasing solar power.

What is wanted, is not a situation remarkable for the amount of influence which the sun exerts upon it during the winter season; for this would be too likely to excite the bulbs into growth at an earlier period than would be desirable. It is of far greater importance that the selected spot be what is termed on a "dry bottom;" that is, where no superfluous water rests among the subsoil; for without this condition there is but little hope of success. The danger to be anticipated from frost is not of any material extent, for the manner in which the surface of the beds should be covered will keep the frost from penetrating to the injury of the roots. The bad effect to be anticipated from the exciting influence of the sun may be avoided by adopt-

ing some means of intercepting its rays during the earlier part of the winter; later in the season this need not be attempted. Another means of keeping the plants from growing so early as to be liable to be checked by the frosts and cold weather of early spring, is to plant in situations having a northern (or at least not a southern) aspect; but the disadvantage of a northern aspect is, that it is there impossible that the plants should derive full advantage from the sun late in the season.

Unless in situations peculiarly favoured, and possessing the advantage of a dry subsoil, and sheltered aspect—conditions, however, rarely to be met with, there is not much probability of their succeeding planted in a promiscuous manner in the flower-beds. Generally speaking, the trouble and attention which would be necessary to render this course successful, would hardly be repaid by the results. This is not the case when they are grown together in beds, for then the whole preparation can be effected at one operation, and the subsequent trouble of attending them is considerably lessened.

In preparing a bed, something like the following course should be adopted:—In the first place, the natural soil should be taken out to the depth of fifteen or eighteen inches, the bottom being made quite even, and inclining either to the front or on one side, so that the moisture, if any, may find its way to the nearest drain. In the bottom of the bed, lay six or eight inches of broken bricks, and on these a layer of rough turfy soil; above this, the bed should be filled up with prepared compost, as good in quality as can be obtained. If the natural soil is light and open, a portion of it may be retained, say one half; to this should be added, a fourth of good loam, and a fourth of turfy peat. If the natural soil is sandy, this mixture will be sufficiently porous; but if it is of a closer texture, enough sand must be added to remedy the evil. As much of this mixture is to be filled in, as will raise the bed four or five inches above the level of the surrounding ground. In planting, the roots are to be covered over about three inches. There are two common methods of planting bulbous plants; one is to make holes for each bulb of the proper depth, by blunt dibbles, which form a hole large enough to drop in the root; in ordinary cases, this is an objectionable plan, especially if the soil is heavy, or rather wetter at the time of planting than is desirable; the pressure of the dibble forms the sides and bottom of the holes more or less into a compact caked mass, which proportionately arrests the percolation of water, to the injury of the bulb; the other plan, which is a far preferable one, is to draw drills with the drill-hoe, of the depth required, in

the bottom of which the bulbs are set at the regular and proper distances, and then carefully covered by returning the soil again into its place, leaving the surface even, so that the roots may be all situated at an equal depth. This may be done in the *fine dry weather* of autumn. After planting, the beds are to be covered over with a thickness of about three inches of dry old tan, or dry sawdust half decayed; either of them will serve as an efficient protector, not only against frost, but also, in a great measure, against wet. If the weather becomes very wet or very severe, some additional portable covering should be employed as long as it appears necessary.

By the latter end of March, if the weather is at the time at all open *part* of the covering of tan or sawdust may be taken off, preparatory to the removal of the whole as soon as mild weather becomes fairly established in the month of April. If from the situation of the bed it would be preferable, for the sake of appearance, to remove the whole of this winter covering, and substitute a lighter one of moss in its place, for a short time, this might be done without detriment to the plants.

At this time of year (spring and summer) the plants are benefited by all the sun they can obtain, therefore nothing should be permitted to shade them unnecessarily in any way. As they grow up, some of the taller kind may require to have their flower-stems tied up to neat stakes. If the weather is very hot when they are in bloom, they may be kept in perfection for a longer period by shading them, but whatever covering may be used for the purpose should be taken off as soon as the bloom is over, and the plants exposed to the full influence of the sun. It is of far greater importance towards a good bloom in the following year, to secure a perfect *development and ripening* of the leaves, under the highest amount of solar influence the plants can be subjected to, than it is to favour by any means the early growth of the roots during autumn or winter; indeed the latter course is the most impolitic one that can be adopted. No further attention is required after the decay of the foliage until the approach of winter, when the beds must be again covered in a manner similar to what has been already recommended. The beds do not require replanting every year, but once in three or four years will be sufficient.

RAISING FROM SEEDS AND OFFSETS.

The former is but a simple process. It is only necessary to procure the seeds when ripe, and sow them in the ordinary manner immediately afterwards, using broad shallow pans instead of pots, and the same kind of

soil, with a little more sand added, as that previously recommended. The pans may be set in a frame or pit, such as that described as being suited to their growth. They may remain here throughout the first year. The second year, they may be transplanted into other pans, in less sandy soil, and may be grown in these pits till they get large enough to bloom, when they may be treated as the blooming bulbs. This period may be two, three, or more years, just according to the free-growing nature of the kind or otherwise. There is no doubt if these plants were brought into that state of universal cultivation to which their beauty entitles them, a good deal would be effected by hybridizing in securing variety, at least, if not what might be considered to be better flowers.



Ixia columellaris.

Offsets from the old bulbs, which are produced freely, should be managed in a precisely similar manner with the young seedling plants; and they will take about an equal time to attain a flowering state, depending of course a little on the strength of the offset when first planted.

Of those genera which we have enumerated as allied to *Ixia*, the following summary notice will be sufficient as regards treatment. *Babiana* requires to be grown very similarly to *Ixia*; they are generally lower-growing plants, and many of them are very pretty. *Cypella* requires to be grown in a warm greenhouse,

and treated with care. *Geissorhiza*, and *Hesperantha*, should have the greenhouse or pit treatment above detailed. *Sparaxis*, while it admits of being also thus grown, is a trifle more hardy in its nature, and therefore is so much better suited to be grown in sheltered beds out of doors. *Synnetia* requires the treatment of *Ixia*. The hardy kinds of *Trichonema* may be planted in moderately sheltered places out-doors; the others may be grown in the pit or in the greenhouse. Finally, the *Tritonias* belong to the section requiring greenhouse treatment.

All these plants, without exception, are of a gay and showy nature; and a collection of them would possess great interest and beauty, if grown with moderate success. The whole tribe has been for many years neglected; and possibly from this cause, some of the kinds enumerated below may not be at this moment in cultivation; they are nevertheless continually obtainable from the Cape.

SELECT AND DESCRIPTIVE LIST.

IXIA.

These plants are all natives of the Cape of Good Hope. The name is derived from *ixia*, birdlime, because of the viscid nature of some of the species.

Ixia amœna (pleasing *Ixia*).—Native of the Cape. It has pretty red, or rose-coloured flowers, and grows one foot high. Flowers in April and May.

Ixia aristata (salver-flowered *Ixia*).—The leaves are broad; the stem about one foot high; the flowers large, pink, on a long slender tube; blooms in May. There are varieties with white, pale pink, and purple rose-coloured flowers.

Ixia capillaris (hair-stemmed *Ixia*).—There are several varieties of this:—one called *gracillima*, has very narrow leaves, and slender stems one foot high, bearing one whitish cup-shaped flower, with six spreading petals; another called *stricta*, has sword-shaped leaves, and a stem with five or six lilac blooms; another, called *incarnata*, has flesh-coloured and larger blooms; and another, called *aulica*, has still broader leaves, and red flowers. Flowers in April and May.

Ixia capitata (headed *Ixia*).—This has cream-coloured flowers, spotted with blue, and grows about a foot high. Flowers in April and May.

Ixia columellaris (variegated *Ixia*).—The leaves are long and narrowish; stem about a foot high; the flowers spreading, purplish pink, with a dark nearly black centre, and a ring of orange colour around it. Blooms in August. The flowers are fragrant.

Ixia conica (orange-coloured *Ixia*).—The leaves are medium sized; the stem upwards

of a foot high; the flowers in a dense bunch at the top, of a dark orange yellow. Flowers in May.

Ixia crateroides (crater-like Ixia).—This grows at the Cape, in sandy spots, near the Twenty-four rivers. The leaves are narrow; the stem about a foot high; the flowers, two or three at the top of the stem, dark crimson. Flowers in July.

Ixia crispa (curled-leaved Ixia).—A small and slender species, with the leaves much undulated and waved on the margin, giving them a pretty curled or crisped appearance; the stem about nine inches high; the flowers round, rose-coloured. Flowers in June.

Ixia dubia (doubtful Ixia).—This has red flowers, and grows nine inches high. Flowers in April and May.

Ixia erecta (upright Ixia).—Allied to *I. maculata*, differing chiefly in not having the dark stain in the centre. The flowers are white. Flowers in June. There are varieties with flesh-coloured, with orange-yellow, and with greenish flowers; and another with paler yellow flowers, very sweet-scented.

Ixia flexuosa (flexuose Ixia).—The leaves sharp pointed; the stem from one to two feet high; flowers flesh-coloured. Blooms in April. There are varieties with white flowers, white with red streaks, white with purple eye, red, and violet flowers.

Ixia furcata (stained Ixia).—Native of the Cape. It has pink flowers, and grows about six inches high. Flowers in April and May.

Ixia hybrida (spurious Ixia).—The flowers are bluish-coloured; grows nearly two feet high. Flowers from May to July.

Ixia incarnata (flesh-coloured Ixia).—The flowers are pale pink or flesh-coloured. It grows from a foot to a foot and a half high. Flowers from May to July.

Ixia leucantha (white-flowered Ixia).—The flowers of this species are white, and the plant grows to as much as two feet high. Flowers from May to July.

Ixia linearis (linear-leaved Ixia).—This has long narrow leaves, and white flowers, and blooms in April and May. It grows six inches high.

Ixia maculata (spotted Ixia).—This is found at the Cape, by the sides of rivers and brooks. It is a large growing species, with long leaves, and a flower-stem varying in the different varieties from one to three or four feet high, and with from six to twenty and thirty flowers; the flowers of the species are white, with a brown stain at the base: the variety *viridis* has greenish flowers, with the dark stain, and a very large growth: the variety *ochroleuca* is more dwarf, and has pale yellow flowers with a brown stain: the variety *amethystina*, has whitish flowers

tinged with blue, and a black centre. Flowers in April, May, and June.

Ixia monadelphica (monadelphous Ixia).—This species grows about a foot high; the flowers large, spreading, blueish purple, with a crimson margin round the eye. Flowers in April and May. There is a variety called *curta*, with large crocus-like orange-coloured flowers.

Ixia ovata (ovate-spiked Ixia).—This has white and purple-spotted flowers, and grows about a foot high. Flowers from May to July.

Ixia patens (spreading-flowered Ixia).—The leaves of this are broad; the stem about two feet high; the flowers large, spreading, light crimson red. Flowers in April.

Ixia polystachia (lily-of-the-valley-scented Ixia).—Allied to *I. scillaris*, but with a taller and more slender habit. The flowers are pretty—deep pink or rose-coloured, and fragrant. Flowers in May.

Ixia retusa (retuse Ixia).—This has light rose-coloured flowers, and grows two feet high and upwards. Flowers from May to July.

Ixia scillaris (squill-flowered Ixia).—The leaves are short, rather broad; the stem from a foot to a foot and a half high; the colour of the flowers varying, some purple, some rose, some pink, some whitish. Flowers in January. The variety called *latifolia* has broader leaves, and a spike of pretty rose-coloured flowers.

Ixia viridiflora (green-flowered Ixia).—It is a strong growing bulb, two feet and upwards in height, with grass-like leaves, and a long spike of large flowers; they are of a peculiar and pretty watery-green colour, with a purplish-black centre. Flowers in June.

BABIANA.

Babianas are all dwarfish plants, with rather broad sword-shaped leaves, and flowers something like those of the Ixia; they are very pretty plants, all natives of the Cape. The name is derived from *babianer*, because the roots are the favourite food of baboons.

Babiana angustifolia (narrow-leaved Babiana).—This has dark blue flowers from May to July, and grows six inches to one foot high.

Babiana disticha (two-ranked Babiana).—Flowers lilac, or pale blue, from May to July; grows nine inches high; the flowers are scented, like those of hyacinths.

Babiana mucronata (mucronate Babiana).—This has purple flowers, which are produced in May; grows nine inches high.

Babiana nana (dwarf Babiana).—This has blue flowers, and grows six inches high. Flowers in April.

Babiana ochroleuca (cream-coloured Ba-

biana).—The flowers of this are pale yellow coloured, with stripes, and open from May to July ; grows nine inches high.

Babiana obtusifolia (blunt-leaved Babiana).—Blooms in April ; flowers blue ; grows nine inches high.

Babiana plicata (folded Babiana).—This has pale lilac-coloured or blue blossoms, which are very sweet-scented ; it grows nine inches high ; blooms from May to July. There is a variety called *multiplex*, which has purple flowers.

Babiana purpurea (purple-flowered Babiana).—As the name implies, the flowers of this kind are purple ; they open from May to July ; grows nine inches high.

Babiana ringens (gaping Babiana).—Blooms from May to July, with lilac flowers ; grows six inches high.

Babiana rubro-cyanea (red and blue Babiana).—This kind has red and blue flowers, which open from April to June ; grows six to nine inches high.

Babiana sambucina (elder-flower-scented Babiana).—The blooms of this are dark blue or purple, and smell like elder flowers ; blooms from April to June ; grows nine inches high.

Babiana spathacea (spathe-flowered Babiana).—This has lilac flowers from May to July ; grows six inches high.

Babiana stricta (upright Babiana).—This has lilac flowers from May to July ; grows nine inches high.

Babiana sulphurea (sulphur-coloured Babiana).—This has pale yellow flowers from May to July ; grows six to nine inches high.

Babiana tenuiflora (slender-flowered Babiana).—The flowers of this kind are pale lilac, and open from May to July ; grows six to nine inches high.

Babiana Thunbergii (Thunberg's Babiana).—This has purple flowers, in April ; grows about one foot high.

Babiana tubata (long-flowered Babiana).—The flowers are white and red ; it blooms from April to June ; grows nine inches high.

Babiana tubiflora (long-tubed Babiana).—This has yellowish-white and red flowers, and grows six inches high ; blooms from April to June.

Babiana villosa (villose Babiana).—This has crimson-coloured flowers, and blooms from June to August ; grows a foot high.

CYPELLA.

Cypella is a genus of plants allied to *Ixia*, and containing one or two kinds which are of very great beauty. It is of slender habit, and has sword-shaped leaves ; the flowers are goblet-shaped, and the name is derived from *kypellon*, a goblet, in allusion to this form.

They are beautiful greenhouse bulbs, but not suitable for out-door culture.

Cypella Drummondii (Drummond's Cypella).—An elegant slender plant, with yellow and purple flowers, produced from June to September ; it grows two feet and upwards in height. Native of San Felipe.

Cypella Herberti (Herbert's Cypella).—This has orange and lilac flowers, and grows two feet high ; it flowers from June to September. Native of Buenos Ayres.

GEISSORHIZA.

These Cape bulbs, which have been separated from *Ixia*, are named from *geisson*, a tile, and *rhiza*, a root, in allusion to the form of the roots.

Geissorhiza ciliaris (ciliated Tile-root).—This has striped flowers, and blooms from May to July ; it grows about a foot high.

Geissorhiza excisa (short-leaved Tile-root).—This has white and pink flowers in April and May, and grows about six inches high.

Geissorhiza obtusata (blunted Tile-root).—The flowers of this are striped with orange and pink, produced in May and June ; it grows from nine inches to a foot high.

Geissorhiza hirta (hairy Tile-root).—This has white flowers in May and June ; grows nine inches or a foot high.

Geissorhiza imbricata (imbricated Tile-root).—This kind has flowers variegated with red, and blooms in May and June ; grows one foot high.

Geissorhiza juncea (rushy Tile-root).—The flowers of this kind are white ; it blooms in June and July ; about one foot high.

Geissorhiza Larochei (De la Roche's Tile-root).—This has violet-coloured flowers in May and June ; about six inches high.

Geissorhiza secunda (side-flowered Tile-root).—This kind has white flowers, and blooms in May and June ; grows nine inches to a foot high. There is also a variety with white flowers, called *albescens* ; and another with blue flowers, called *cærulea*.

Geissorhiza setacea (bristly Tile-root).—This has sulphur-coloured flowers, and blooms in June and July ; grows about a foot high.

Geissorhiza sublutea (yellowish Tile-root).—This has yellow flowers in May and June ; grows about one foot high.

Geissorhiza vaginata (sheathing Tile-root).—The flowers of this kind are yellow and purple ; it blooms from June to September, and grows from a foot to a foot and a half high.

HESPERANTHA.

This is a genus of Cape bulbs, separated from *Ixia* ; they are named from *hespera*, an evening, and *anthos*, a flower, in allusion to the habit of the plants, which is to open their flowers in the evening.

Hesperantha angusta (narrow-leaved Evening-flower).—This has white flowers in May; grows six inches high; it is sweet-scented.

Hesperantha cinnamomea (cinnamon Evening-flower).—The flowers are white, in April and May; grows six inches high; it is sweet-scented.

Hesperantha fulcata (sickle-leaved Evening-flower).—This has white and brown sweet-scented flowers in April and May; grows six inches high.

Hesperantha graminifolia (grass-leaved Evening-flower).—This has white and brown flowers, and blooms from August to October; it grows six inches high; the flowers are sweet-scented.

Hesperantha pilosa (hairy Evening-flower).—This has white and brown-coloured flowers in April and May; grows six inches high.

Hesperantha radiata (radiated Evening-flower).—The flowers of this are white, and sweet-scented; blooming in April and May; it grows nearly a foot high.

SPARAXIS.

The Sparaxæ are very ornamental plants, with very much of the general appearance of Ixias. The name is derived from *sparasso*, I tear, in allusion to the lacerated spathes—broad sheathing leaves which enclose the flower buds. A good many hybrids, many of them very beautiful ones, have been raised by florists.

Sparaxis anemoniflora (anemone-flowered Sparaxis).—This has white flowers, and blooms in May; grows from nine inches to a foot high.

Sparaxis bicolor (two-coloured Sparaxis).—The flowers of this are blue and yellow, and are produced in April and May; it grows about nine inches high.

Sparaxis bulbifera (bulb-bearing Sparaxis).—This has violet-coloured flowers, and blooms in May and June; it grows a foot high. There is a variety called *lutea*, having yellow flowers; another, *lutea striata*, with yellow-striped flowers; and another, *sulphurea striata*, with sulphur-coloured striped flowers.

Sparaxis blanda (blush-flowered Sparaxis).—The flowers are pink and white, blooming in May and June; grows one foot high.

Sparaxis fragrans (sweet-scented Sparaxis).—This has yellow flowers in May and June; grows one foot high.

Sparaxis grandiflora (large-flowered Sparaxis).—This has purple flowers in May and June, and grows one foot high. There are varieties called *liliago*, with white flowers, and *striata*, with variegated ones.

Sparaxis Griffini (Griffin's Sparaxis).—This bears purple and yellow flowers in May and June, and grows one foot high.

Sparaxis lineata (pencilled Sparaxis).—

This has white and pink flowers in May and June; it grows one foot high.

Sparaxis pendula (pendulous Sparaxis).—The flowers of this are dark pink, produced in June; grows one foot high. This is hardier than some others.

Sparaxis stellaris (starry Sparaxis).—The flowers are purple, in June; grows one foot high, and, like the last, is hardier than many of the kinds.

Sparaxis sanguinea (blood-coloured Sparaxis).—This has purplish-red flowers, in May and June; grows one foot high.

Sparaxis tricolor (three-coloured Sparaxis).—The flowers of this kind are orange, brown, and yellow; blooms during May and June; grows one foot high. This species has been a good deal hybridized, and has given rise to numerous handsome variations. Of the named varieties there are, *roseo-alba*, with pink flowers; *sanguineo-purpurea*, red; and *violaceo-purpurea*, with flowers of a violet purple.

Sparaxis versicolor (various-coloured Sparaxis).—This has purplish flowers, spotted with yellow and red; blooms in June; grows one foot high. Somewhat hardier than many.

SYNNETIA.

These are handsome plants, related to Ixia and Sparaxis, and requiring similar treatment; they are all from the Cape of Good Hope. The genus is named in honour of Mr. W. Synnet, a collector.

Synnetia bicolor (two-coloured Synnetia). This has lilac and yellow flowers in March and April; from six to nine inches high.

Synnetia galeata (helmet-flowered Synnetia).—This has yellow and brownish flowers in April; grows one foot high.

Synnetia variegata (variegated Synnetia).—The flowers of this are purple and yellow, and are produced from April to July; grows one foot high.

TRICHONEMA.

Trichonemas are pretty bulbs, some of which are hardy, while others require a greenhouse. The name is derived from *thrix*, a hair, and *nema*, a filament, the filaments being hairy. They are chiefly, but not entirely, from the Cape of Good Hope.

Trichonema Bulbodium (channel-leaved Trichonema).—This is a hardy bulb, with reddish lilac flowers, produced in April and May; it grows six inches high.

Trichonema caulescens (stalked Trichonema).—The flowers of this are yellow, in June and July; grows six inches high.

Trichonema chloroleucum (milk-coloured Trichonema).—This has greenish-white flowers, in June; grows six inches high.

Trichonema celestinum (sky-blue Tricho-

nema).—This has purplish-blue flowers, in April and May; grows six inches high; hardy.

Trichonema Columnæ (Columnæ's Trichonema).—The flowers are blue, in March and April; grows six inches high; hardy.

Trichonema cruciatum (cross-leaved Trichonema).—This has rose-coloured or pink flowers, in April and May; grows nine inches high; succeeds well in a frame.

Trichonema filifolium (thread-leaved Trichonema).—The flowers are yellow, in April and May; grows nine inches high.

Trichonema longifolium (long-leaved Trichonema).—The flowers are rose-coloured, in April and May; grows six inches high; succeeds well in a frame.

Trichonema pudicum (blush Trichonema).—This has pale pink flowers from June to August; grows six inches high.

Trichonema purpurascens (purplish Trichonema).—This has purple flowers, in April and May; grows nine inches high.

Trichonema Pylum (Pylum Trichonema).—This has white and yellow flowers, and is a Grecian species; grows six inches high.

Trichonema ramiflorum (branch-flowered Trichonema).—This has purple flowers, in May and June; six inches high. It is hardy.

Trichonema recurvum (recurved Trichonema).—The flowers of this are red, in May and June; grows six inches high.

Trichonema roseum (rose-coloured Trichonema).—This has rose-coloured and purple flowers, and blooms from June to August; grows six inches high.

Trichonema speciosum (showy Trichonema).—The flowers of this are light crimson; from March to May; grows six inches high.

Trichonema sub-palustre (Greek-marsh Trichonema).—This has purplish-lilac flowers, and grows about six inches high.

Trichonema tortuosum (twisted-leaved Trichonema).—The flowers are yellow, produced in May; grows six inches high.

TRITONIA.

These are closely allied to Ixias. The name is derived from *triton*, a weathercock, in allusion to the variable direction of the stamens in the various species. All are natives of the Cape of Good Hope.

Tritonia anigozanthiflora (anigozanthos-flowered Tritonia).—This has green flowers from June to August; grows nine inches to a foot high.

Tritonia aurea (golden Tritonia).—This has splendid orange-coloured blossoms, produced towards the end of summer; grows about two feet high.

Tritonia capensis (Cape Tritonia).—This has cream-coloured flowers from August to October; grows nine inches to a foot high.

Tritonia concolor (self-coloured Tritonia).—This has pale yellow flowers from April to June; grows nine inches high.

Tritonia crispa (curled Tritonia).—This has pink and cream-coloured flowers from June to August; grows nine inches high.

Tritonia crocata (saffron-coloured Tritonia).—This has deep orange-coloured flowers, and blooms from May to July; grows one foot high. There is a variety called *pallida*, with pale orange flowers.

Tritonia deusta (blasted Tritonia).—This has orange-spotted flowers, and blooms from May to July; grows nine inches high.

Tritonia fenestrata (open-flowered or windowed Tritonia).—This has yellow or orange-coloured flowers, and blooms from May to July; grows one foot and a half high.

Tritonia flava (yellow Tritonia).—The flowers are yellow, produced from May to July; grows six inches high.

Tritonia fucata (stained Tritonia).—This has red and yellow flowers, and blooms in May and June; grows one foot high.

Tritonia lineata (pencilled Tritonia).—This has cream-coloured striped flowers from May to July; grows two feet high.

Tritonia longiflora (long-flowered Tritonia).—This has pale buff striped flowers from May to July; grows one foot and a half high.

Tritonia miniata (vermilion Tritonia).—The flowers are bright orange, produced from July to September; grows nine inches high.

Tritonia odorata (sweet-scented Tritonia).—This produces yellow flowers in August; grows six inches high.

Tritonia pallida (pale-flowered Tritonia).—This has white flowers, and blooms in August; grows one foot high.

Tritonia pectinata (pectinated Tritonia).—This produces yellow flowers in May; grows one foot high.

Tritonia refracta (reflexed Tritonia).—This has green, yellow, and orange flowers in June and July; a foot and a half high.

Tritonia Rocheana (De la Roche's Tritonia).—This bears cream-coloured flowers in July and August; a foot and a half high.

Tritonia rosea (rose-coloured Tritonia).—The flowers are cream-coloured, striped with rose; it blooms in June and July; and grows a foot and a half high.

Tritonia securigera (axe-bearing Tritonia).—This has brownish orange flowers; blooms from May to July; grows nine inches high.

Tritonia squalida (squalid Tritonia).—This has white and pink flowers, and blooms from May to July; grows nine inches high.

Tritonia striata (striped Tritonia).—This has blue flowers; blooms in May and June; grows one foot high.

Tritonia tenuiflora (slender-flowered Tri-

tonia).—This produces pale yellow flowers from May to July; a foot and a half high.

Tritonia viridis (green-flowered Tritonia).—The flowers of this are of a reddish green, blooming from May to July; grows about a foot high.

Tritonia xanthospila (yellow-spotted Tritonia).—This has white and yellow flowers, and blooms in June and July; grows one foot high.

THE BEST VARIETIES IN CULTIVATION OF TWENTY-ONE SORTS OF FLOWERS.

PERIODICALLY it is necessary to give amateur florists an idea of the best subjects to cultivate, because when new and improved varieties appear, they must turn out inferior ones from all limited collections; and there are many persons who grow so few that it is of the highest importance to be informed now and then of those that keep the lead, that collections may be corrected by the addition of novelties that are actually better, or different from, and as good as those in cultivation already. We are aware that there are other sources from which lists can be taken, but those which can be depended on are too large for small growers; others only mislead them.

It may be said there are other flowers as good as we name, but suppose there be some as good, and they are not better, our list cannot mislead; for instance, in mentioning a dozen of any thing of which there are hundreds, when we come towards the last, down to the quality of which there may be many equally good or bad, we can only take the number we want, and in such case we are guided by the colour or character we require to form the best small collection. These lists will be found useful to young beginners, because it is most essential to begin with the best, and it is well known that young florists have always been the dupes of the older and more cunning ones.

It has been a general feeling among old florists, that inferior sorts, such as they began with, are good enough for beginners now; but our notion is, that the young man who never grew a thing before ought to begin with the best; and not waste his money in a single flower that is of second-rate character, while he can get enough of the first. Those who are growing such subjects, or any one of them, may consult the lists with advantage; for, if they find any among those named that they do not already cultivate, they ought to lose no time in procuring them. The following may be considered the best that can be selected of each tribe of flowers up to the present time. Some flowers stand their ground well, and

others exhibit great changes from the rapid improvements that are made every season.

DAHLIAS.—Berryer, Scarlet Gem, Yellow Standard, Standard of Perfection, Queen of Roses, Queen of Sheba, Marchioness Cornwallis, Princess Radzivil, Gem, Shylock, Walter Hilson, Delight.

CARNATIONS.—Colcut's Brutus, Martin's Splendid, Mansley's Robert Burns, Ely's Lord Milton, Mansley's Beauty of Woodhouse, Norman's Duke of Wellington, Brookes's Flora's Garland, Wood's Rosabelle, Twitchet's Don John, Taylor's Lord Byron, Ward's Sarah Payne, Newhall's Memento.

PICOTEES.—Wildman's Isabella, Sharp's Countess de Grey, Edmund's Jenny Lind, Headley's King James, Headley's Venus, Burroughs's Emma, Read's Antagonist, Matthews's Enchantress, Sharp's l'Elégant, Crask's Queen Victoria, Barnard's Mrs. Barnard, Garrett's Lady Dacre, Matthews's Eclipse.

PINKS.—Bragg's George Glenney, Hale's Queen of England, Turner's Masterpiece, Turner's XX, Norman's X.Y.Z., Wilmer's Laura, Fairbairn's Bob Lawrence, Church's Rowena, Turner's Beauty, Ward's Great Britain, Norman's Henry Steers, Garrett's Queen of Roses.

VERBENAS.—Beauty of Bracondale, Scarlet Defiance, European, Lilac Rival, Fairy, Lady of the Lake, St. Margaret's, Vixen, Queen of Roses, Attraction, Lord John Russell, Elvira.

HYACINTHS.—Waterloo, Groot Voorst, Grand Vainqueur, Alamode (double white), Alamode (double blue), Duc de Normandy, Vulcan, Orondates, Lord Wellington, Pasquin, Voltaire, Bouquet d'Orange.

AURICULAS.—Page's Champion, Lee's Col. Taylor, Booth's Freedom, Lightbody's Lord Lynedoch, Dickson's Matilda, Dickson's Prince Albert, Fletcher's Ne Plus Ultra, Dickson's Unique, Waterhouse's Conqueror of Europe, Oliver's Lovely Anne, Grimes's Privateer, Taylor's Glory, Thorpe's Maggie.

FUCHSIAS.—One in the Ring, Newberry's Delicata, Elphinstone's Ne Plus Ultra, Kendal's Elizabeth, Smith's Ne Plus Ultra, Formosa Elegans, Turvill's Fountain, Ludovico, Beauty of Chelmsford, Globosa Carneae, Loganii, Splendida.

POLYANTHUSES.—Errington's Fire King, Craiggy's Tartarian, Britannia, Bertram, Highland Mary, Cox's Regent, Bang Europe, Buonaparte, Black and Gold, Beauty of England, Alexander, Bucephalus.

PANSIES.—Zabdi, Cossack, Constellation, Achilles, Othello, Example, Model of Perfection, Mrs. M. Hamilton, Rouelle's Supreme, Hore's Superb, Lord Hardinge, Prince of Orange, Cypress, Mary, Blue Fringe, Falkirk

Hero, Duchess of Rutland, Marginata, Candidate, Mrs. Montgomerie, Titian, Tom Pinch, White Sergeant, Goliah.

AZALEA INDICA.—Gledstanesii, Variegata, Præstantissima, Splendens, Lateritia, Murrayana, Danieliana.

CAMELLIA JAPONICA.—Duchesse d'Orleans, Laudrether, Henry Favre, Marchioness of Exeter, Countess of Orkney, Palmer's Perfection, Queen Victoria, Amabilis, Le Marchand, Bisanthian, Causwelliana, Palmeri.

RANUNCULUSES.—Alexis, Attraction, Creon, Delectus, Edgar, Felix, Herbert, Chimpanzee, Grace Darling, Lady Sale, Mrs. Glenn, Licitor, Nina, Numa, Prince of Wales, Splendour, Zobeide, Mrs. Bragg, Richard Hardy, Sir Philip Broke, Talisman, Nicander, Pertinax, Vendome, Victor.

GERANIUMS.—Miller's Distinctus, Volgius; Beck's Patrician, Hebe's Lip, Compactum, Centurion, Cruenta, Cavalier, Cassandra, Guelma, Gustavus, Honora, Rosamond; Hoyle's Sunset, Mount Etna, President; Gaines's Rising Sun; Lynes's Fire-fly; Foster's Celia, Armada, Pericles, Painted Lady, Paragon, Satellite.

CINERARIAS.—Nobilis, Colossus, Conqueror, Delicata, Sir Robert Peel, Brilliant, Beauty of Wouham, Standard, Vernalis, Maritima, Attraction, Celestina, Bijou, Lady Prudhoe, Azurea alba, Slough Rival, Anna, Maid of Orleans.

RHODODENDRONS.—Arboreum, Alta-cle-rense, Campanulatum, Catawbiense, Caucasicum, Nobleanum, Glennyannum, Cunninghamii, Russellianum, Tigrinum, Campanulatum Hybridum, Javanicum.

CALCEOLARIAS.—Masterpiece, Puissant, Julia, Lady Anne Charteris, Kinghornii, Emperor, Oscar, Lord Hardinge, Marmion, Marquetry, Matchless, Orlando.

ROSES OF SINGULAR HABIT.—Curled-crested Moss, New-crested Moss, Crimson-crested Moss, Milkmaid Clina, Weeping Rose, Willisonii, Moss de Meux Minima, Victoria's Bridal Wreath, Tom Thumb, Garland, Blotched-leaved Bengal, Mousseau presque partout.

CHRYSANTHEMUMS.—Campestroni, Formosum, Goliah, Princess Maria, Clustered Yellow, Annie Salter, Two-coloured incurved, Aristides, Lucidum, King, Beauty, Defiance.

PETUNIAS.—Jenny Lind, Madame Celeste, Ellen Chaplin, Marginata, Marginata Superba, Miss Woolgar, Semidouble, Ivery's Model, Walkerii, Punctata.

TROPÆOLUMS.—Tricolor (scarlet, yellow and black), Lobbianum (orange-scarlet), Azureum (dull blue), Brachyceras (yellow), Speciosum (brilliant scarlet).

These may be depended on for the best selections that any one can begin with, not

only as comprising the best established favourites among flowers that are familiar to old florists, but the best of the new ones calculated to take their places among approved sorts.

GARDENING MEMORANDA FOR JANUARY.*

GARDENING operations during the winter months are, for the most part, confined to the protection of crops and plants, and the preparation of ground for the reception of others. The dunging and dressing, digging, trenching, with occasional cleaning, are the chief kinds of work, and this depends greatly on the weather. All the tender crops require litter to be put on at night, and taken off in the morning, in fine weather, but continued in frost. The pits and frames in which potted plants are placed must also be covered with mats or cloths, or long straw, to keep off frost, and uncovered by day, unless it be very severe. All these winter protections are, more or less, injurious to crops and plants, and therefore should be used as little as possible; every thing is better for the full air when it is mild, so that litter, and other covering, should be removed as early as possible when there is no frost, so as that plants should never lose daylight, if it can be avoided. The glasses may be taken off altogether whenever the weather is suitable, but the plants must be protected against rain and heavy falls, as much as against frost and bleak winds. Alterations, making new garden walks, or clumps, go on all through winter in favourable weather, and planting may be done from November to March; but the earlier the better, on account of the interruptions which occasionally stop every thing, such as a long interval of wet weather or hard frost. The stove requires little more than attention to the heat, which must be kept up uniformly; but, contrary to the too prevalent custom, the heat should be greater by daylight than by dark; keep up the heat, therefore, all day, and it will bear to sink a few degrees, without injury to the plants, by night. The greenhouse and conservatory should have as much air as possible in mild weather; and if frosty, keep the fire going all day, while air may, more or less, be given, and close all the glass, and cover the plants with mats by night. The forcing houses require constant attention to the fires throughout the month.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING JANUARY.

The Greenhouse.—From forty to forty-five

* A very elaborate and complete Calendar of Gardening Operations for January is published in No. 25 of the Horticultural Magazine.

degrees by day, and from thirty-five to forty degrees by night.

The Conservatory.—Fifty-five degrees by day, and forty-five degrees by night. Make an allowance of five degrees according to weather.

The Plant-Stove.—From fifty-five to sixty

degrees by day, and fifty to fifty-five degrees by night.

The Orchid-House.—The flowering-house from sixty to sixty-five degrees by day, and fifty-five to sixty degrees by night; the resting-house from six to ten degrees colder.



TROPÆOLUM UMBELLATUM.

Tropæolum umbellatum, Hooker (umbellate Indian Cress).—Tropæolaceæ § Tropæoleæ.

This plant is altogether distinct from any other species of Indian cress which has found its way to our gardens. Paucity of blossoms is by no means a character applicable to any of the Tropæolums; nevertheless, in the species under consideration, the ordinary proportion of blossoms is quintupled, for instead of their being produced, as is usually the case, singly along the stems, in this they grow in the same position, but in bunches of from four to six together. This habit of blooming gives the plant an aspect altogether different from that of the species which are more familiar to us.

Our plant has a tuberous root, which, according to Professor Jameson, reaches the weight of three to four pounds; the plant is, therefore, of course perennial. The climbing stem is slender but fleshy; it has, moreover, a zig-zag direction, and is of a purplish colour. The leaves, which are rather large, and somewhat remotely situated, are sub-peltate and cordate, deeply cleft into five ovate obtuse lobes, which are mucronate when young; they are attached to long flexuous petioles: the younger leaves on the flowering branches appear to be generally smaller, and to have more

the form of those of the ivy, but somewhat deeply lobed. The flowers grow in umbels from the axils of the leaves, and are of singular external structure; the calyx is cylindrical, with an erect (straight) limb of five unequal lobes, and continued at the base into a stout curved blunt spur, which is shorter than the calyx itself; the colour is orange-red, tipped with green at both extremities, the limb being yellowish; the petals are very unequal in size, but are spatulate and clawed, as well as erect (not spreading); the three lower ones are red, projecting a little beyond the calyx; the two others orange, and very minute: the flowers are thus, no less than the manner in which they are produced, very different from those of the other species of the genus; they are produced very freely during the summer months—so freely, indeed, as quite overpower the foliage.

It is a South American species. Professor Jameson, of Quito, first found it on a mountain called Pilzhum, (to which, he observes, it is quite peculiar,) at an elevation of 7000 feet above the level of the sea. For its introduction to our gardens, however, we are indebted, as for several other beautiful Tropæoleæ, to Messrs. Veitch and Son, of Exeter, who obtained it through their collector, Mr. Lobb,

probably from the same locality where it was found by Professor Jameson.

From the nature of its locality, there can be little doubt of its proving to be amongst the most hardy species of the genus. The roots of some, at least, of the other kinds—those of *T. pentaphyllum* for example—are certainly hardy; that is to say, they will stand uninjured in the ground during winter, and produce young stems again in spring, flowering freely in summer and autumn, *provided* the situation be fairly relieved of stagnant water, and the surface of the ground is covered before severe frost sets in with some dry protective material, either such as half-decayed tanner's bark, or fine turfy peat-earth, or, where appearance is not much an object, a good layer of dry fern, or litter. Nothing could be more beautiful than a series of our—usually considered—greenhouse species so treated; and we should have full confidence of success in making such an experiment. What splendid additions to ordinary flower-garden creepers would be derived from the rich colour of many species of *Tropæolum*.

The *Tropæolums* grow exceedingly well in a compost consisting of the turfy portions of sandy loam, mixed with broken charcoal, liquid manure, in a clear and diluted state,

being given to the plants, when growing, freely, and approaching the blooming state. When grown in pots, they should be planted at once in those in which they are to flower, as the trellises for the branches require to be adjusted as soon as they begin to grow, after which it becomes exceedingly tedious and hazardous to attempt removing the plants from one pot to another. Many of the species have a strong tendency to grow during the winter months; and if they are placed in situations where they can enjoy plenty of light and air, without being subjected to cold draughts, their growth is more healthy at that season than what is often obtained in what would be thought to be the more favourable period of advanced spring; probably they suffer from the confined heat, and, if so, this explains how it is that they flourish so perfectly, under proper regimen, in the open air. It is by no means advisable to endeavour to check this winter-growing tendency when it becomes at all apparent in any of the tubers.

Tropæolums are freely propagated by cuttings, which, however, require some care lest they should be suffered to lapse into a state of rest before the young tubers are organized for their perpetuation. Seeds, whenever produced, will originate more vigorous plants.

NEW FLOWERS AND PLANTS.

CHÆNESTES LANCEOLATA, *Miers* (lance-leaved *Chænestes*).—*Solanaceæ* § *Curvembryæ*.—A handsome, though somewhat strong growing shrub, the young branches of which are herbaceous, and clothed with stellate hairs. The leaves are rather large, alternate, oval or elliptic-lanceolate, clothed with soft stellate hairs beneath, arachnoid (cobwebbed) when young, but becoming almost glabrous with age. The flowers grow in umbels from the axils, or rather somewhat elevated from the axils, so as to be almost terminal, with the young shoots pushing past them; they are drooping, the corolla cylindrical, slightly dilated at the mouth, two inches long, and of a rich deep purplish blue. Native of the mountains of Quindiu. Introduced in 1846. Flowers in summer and autumn. *Culture*.—Requires a greenhouse; blooms well, planted against a wall, in summer and autumn; light loamy soil; propagated by cuttings.

BROWALLIA SPECIOSA, *Hooker* (showy-flowered *Browallia*).—*Scrophulariaceæ* § *Salpiglossideæ*.—A pretty [annual?] plant, with erect branching stems, and opposite, sometimes alternate, ovate-acuminate leaves, from the axils of which proceed the solitary flowers; these are large, about two inches across, with a slender tube of about the same length, and a spreading limb of five unequal

ovate-acuminate segments; the colour is purple, white in the throat, pale lilac beneath. "The flowers are thrice the size of those of *B. grandiflora*." Native of the mountains of Tolima and Quindiu. Introduced in 1846. Flowers in the latter part of summer and the autumn. *Culture*.—Requires a stove or hot-bed frame, flowering in the greenhouse; light sandy soil; propagated by seeds.

EXACUM TETRAGONUM, *var. bicolor* (two-coloured, square-stalked *Exacum*).—*Gentianaceæ* § *Gentianeæ*.—A pretty annual plant, growing a foot or more in height, the stem tetragonous (squared) with the angles winged. The leaves are broadly ovate, becoming narrower upwards, sometimes even lanceolate-acuminate in the upper parts. The flowers grow at the top of the stem, in a many-flowered cyme or panicle, the branches of which are dichotomous, with a single flower in each axil; they are formed of four obliquely-ovate recurved petals, which are of a purple colour (deeper or paler), white at the base—sometimes wholly purple; they vary remarkably both in size and colour. Native of the East Indies. Introduced in 1846. Flowers in June and July. It is the *Exacum bicolor* (Roxburgh). *Culture*.—Requires a stove; light sandy soil; propagated by seeds.

GESNERA TRIFLORA, *Hooker* (three-flow-

ered Gesnera).—*Gesneraceæ* § *Gesnerææ*.—A rather coarse and few-flowered species of *Gesnera*, with tuberous roots, and growing from a foot and a half to two feet high, densely clothed with rusty tomentum. The leaves are large, opposite, and distant, ovate-acuminate, serrated, dark-green above and downy beneath. The flowers grow in umbels of three together, in the axils of the leaves, the stalks being much shorter than the leaves; they are tubular, swollen on one side, and slightly curved, yellow, densely clothed with shaggy red hairs; the mouth of the tube is contracted and spotted, as is the limb of five short rounded segments. Native of New Grenada. Introduced in 1846. Flowers throughout the summer. *Culture*.—Requires a stove; rich light loamy soil; propagated by cuttings.

ONCIDIUM CURTUM, *Lindley* (crop-eared Oncid).—*Orchidaceæ* § *Vandææ-Brassidææ*.—This is a very handsome epiphytal species. The pseudo bulbs and leaves are not described. The flowers are large, densely paniculate; the sepals and petals broad and obtuse, almost entirely of a reddish-brown colour, the upper sepal however being barred with yellow; the lip is of roundish outline, somewhat bilobed at the apex, auricled at the base, yellow, with a broad marginal band of brown. Native country? Introduced about 1846. Flowers in July. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the root.

ONCIDIUM AMICTUM, *Lindley* (frilled Oncid).—*Orchidaceæ* § *Vandææ-Brassidææ*.—A very handsome epiphytal species; the pseudo-bulbs elongate-ovate, bearing two oblong leaves. The scape is spotted, supporting a small but dense panicle of bright yellow flowers, richly spotted with brown-crimson, the petals and sepals with a large central blotch of the same colour. Native of Brazil. Introduced in 1846. Flowers in April. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the plant.

GARDENIA NITIDA, *Hooker* (glossy-leaved Gardenia).—*Cinchonaceæ* § *Cinchonææ-Gardenidææ*.—A very distinct and handsome shrubby plant, remarkable for its dense compact sturdy habit, which renders it eminently suited for pot-culture. The plant is glabrous in every part, the young branches herbaceous, the leaves large, oblong lanceolate, tapering at both extremities. The flowers are axillary, solitary, sessile, large, white, and deliciously fragrant, with a slender cylindrical tube about three inches long, the limb divided into seven narrowish oblong segments, nearly two inches long, but soon becoming reflexed. Native of *Sierre Leone*. Introduced about 1845, by *Messrs. Lucombe, Pince, and Co., of Exeter,*

who raised it from seeds taken from a dried specimen, gathered by Mr. Whitfield. Flowers in October and November, and probably at other seasons. *Culture*.—Requires a stove; turfy loam, peat, and charcoal; propagated by cuttings planted in sand, and placed in a hotbed.

THIBAUDIA PICHINCHENSIS, *var. glabra* (glabrous Pichinchan Thibaudia).—*Vacciniaceæ*.—This plant is eminently beautiful. It forms a shrub, flowering when quite small, but naturally attaining from ten to twelve feet in height. It produces ovate-oblong, acuminate, sub-coriaceous leaves, in the axils of which are borne the short racemes of from four to six or more flowers; these a good deal resemble those of a tubular heath, and are of a lovely waxy rose-red, palest towards the extremity. Native of South America; the present variety was sent from the elevated mountains of Columbia. Introduced in 1846. Flowers in autumn. *Culture*.—Requires a greenhouse; turfy peat soil, mixed with sharp sand and charcoal; propagated by cuttings, layers, or by grafting.

EPIMEDIUM COLCHICUM, *Maunder* (yellow Barren-wort).—*Berberidaceæ* § *Nandineæ*.—A pretty dwarf perennial alpine plant, attaining when full grown about a foot in height, furnished with compound leaves, the individual leaflets of which are heart-shaped, and producing an upright raceme, bearing many small yellowish-green flowers. It is perhaps one of the best species of the genus. Supposed to be a native of Japan. Introduced in 1846, through M. Makoy, of Liege. Flowers in April. *Culture*.—Requires slight protection in winter (with other delicate alpine plants); turfy peat and loam; propagated by dividing the plant.

STENORHYNCHUS CINNABARINUS, *Lindley* (cinnabar *Stenorhynchus*).—*Orchidaceæ* § *Neottææ-Spiranthidææ*.—A rare and handsome perennial herbaceous plant, producing oblong-lanceolate sharp-pointed leaves, and a hairy scape, surmounted by a compact conical head of flowers, which are vermilion red externally and bright yellow on the inner face, which is a good deal exposed, and are supported each by a dull olive-green bract. Native of Mexico. Introduced about 1846. Flowers in July. It is the *Neottea cinnabarina* (Llave); and is called by the Mexicans, *Cutsis*. *Culture*.—Requires a good greenhouse; turfy peat soil, and to be potted like other herbaceous plants; propagated by division of the plant.

BOLBOPHYLLUM HIETUM, *Lindley* (hairy-flowered *Bolbophyll*).—*Orchidaceæ* § *Malaxææ-Dendrobidææ*.—A small curious plant, with elongate-ovate pseudo-bulbs, broad strap-shaped obtuse leaves, and a drooping tail-like

spike of small whitish flowers, the sepals clothed, and the petals ciliated, with hairs. Native of the East Indies, where it grows on trees. Introduced about 1846. Flowers in autumn. It is the *Stelis hirta* (Smith); and *Tribrachia hirta* (Lindley). *Culture*.—Requires a stove; turfy peat soil; division of the plant.

CYMBIDIUM EBURNEUM, *Lindley* (ivory Cymbid).—Orchidaceæ & Vandææ-Brassidæ.—A large and very handsome perennial herbaceous plant. The leaves are long, narrow, sword-shaped, and are bilobed at the end; from their axils are produced the flowers, about two together, at the extremity of a long drooping scape; they are very large, pure ivory-white, with one broad yellow stripe along the middle of the lip; moreover, they are deliciously fragrant. Native of the East Indies. Introduced about 1846. Flowers in August and September. *Culture*.—Requires a hot moist stove; turfy peat soil; propagated by division of the plant.

SOBRALIA MACRANTHA, *var. splendens* (splendid large-flowered Sobralia).—Orchidaceæ & Arethuseæ-Vanillidæ.—The Sobralias have a reedy habit, stiff plaited leaves, and for the most part large splendid blossoms; this is the case with *S. macrantha*. The present variety differs chiefly in stature, and in the colour of its blossoms; being dwarfer, not growing more than from two to three feet high, and producing large deep rich crimson-purple blossoms, which have a slender curved neck, elliptic reflexed sepals and petals, and a prominent rolled up (so as to appear funnel-shaped) lip, the lower edge of which is expanded and frilled, and the inside yellowish. *Culture*.—Requires a stove; turfy peat and turfy loam; propagated by division of the plant; young plants are also to be obtained by enveloping one of the joints of the stem with moss, which is to be kept constantly damp; in this case the stem should be slightly cut through below where the moss is applied.

BARKERIA SKINNERI, *var. major* (large-flowered Skinner's Barkeria).—Orchidaceæ & Epidendrææ-Læliadæ.—This variety is much superior to that generally cultivated; the flower scape grows nearly two feet high, bearing upwards of thirty blossoms, which are of a deep reddish purple-lilac colour. It is, we presume, a native of Mexico. Introduced about 1845. Flowers in autumn. *Culture*.—Requires a stove; turfy peat soil, or to be fixed on a block of wood; propagated by division of the plant.

CYPRIPEDIUM LOWEI, *Lindley* (Mr. Lowe's Lady's Slipper).—Orchidaceæ & Cypripedææ.—A very beautiful addition to the epiphytal section of Lady's Slippers. The leaves, which are all produced from the root, are strap-

shaped; the flower-stem produces a raceme of from four to eight blossoms, most beautiful in their way; the sepals are green, with a purple tinge near the base; the petals spatulate, nearly three inches long (much longer than the lip), gracefully curving inwards and downwards, near the base of a pale greenish-yellow, with numerous well-defined purple blotches, rich violet-purple at the apex, and having a few stiff marginal hairs; the oblong pouch-shaped lip is purplish-green, shining as if varnished. The cut blooms—of course those on the plant also—continue long in perfection. Native of Borneo, where it grows on high trees in thick jungle, flowering in April and May. Introduced, in 1846, by Mr. Lowe. In cultivation it has flowered in October and November. *Culture*.—Requires a hot moist stove, and a degree of shade; turfy peat soil, or to be fixed to a block of wood; propagated by division of the plant.

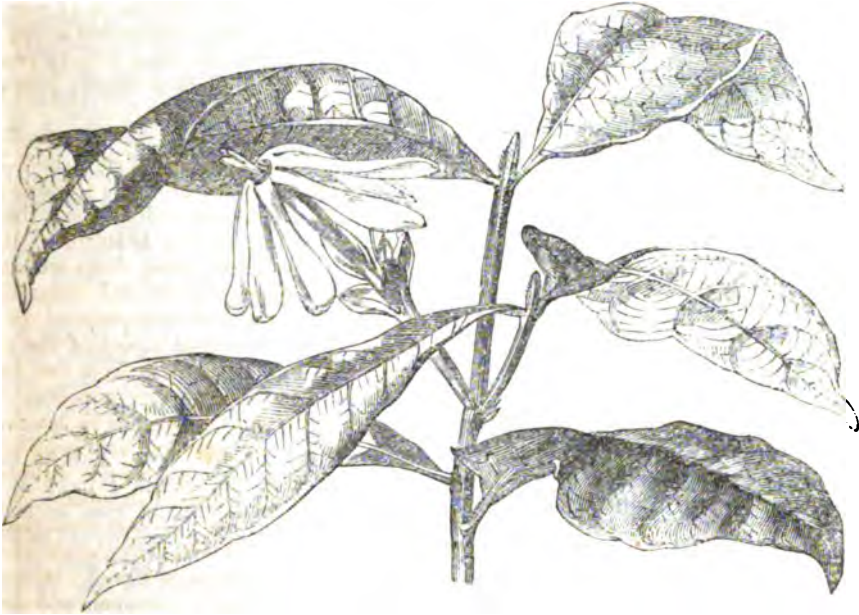
DIPLADENIA NOBILIS, *Morren* (noble Dipladene).—Apocynaceæ & Wrightææ.—This is a distinct species, and promises to make a very ornamental subject for cultivation; the blossoms are themselves very beautiful. It has a largish tuberous-like corm, from which issue the stems; apparently several stems may be induced, and on this will depend in great measure the ornamental aspect of the plants; these stems appear to grow from two to three feet long. The leaves are opposite, oblong acute, on very short stalks. The flowers grow in one-sided racemes, and are large and distinct, the corolla being between tubular and campanulate, with roundish ovate spreading lobes. There are two distinct varieties,—one with a whitish limb and pink throat, the other entirely pink. Native of Brazil. Introduced in 1847. Flowers in summer and autumn. *Culture*.—Requires a stove, and bears exposure to sun; coarse peat and sand; propagated by cuttings.

DENDROBIUM TORTILE, *Lindley* (twisted Dendrobe).—Orchidaceæ & Malaxææ-Dendrobidæ.—A very beautiful species, with erect furrowed stems, which protrude from the joints a profusion of large showy flowers growing in threes; the sepals are linear oblong, blunt, reflexed and twisted; the petals broader, wavy and twisted, spreading but not reflexed; the lip is rolled up at the base, roundish, slightly rhomboidal, and finely notched; these flowers are of a pale clear lilac, with a lemon-yellow lip, veined at the bottom with rich purple. It is allied to *D. nobile*. The foliage is not described. Native of Java. Introduced, in 1846, by Messrs. Veitch. Flowers in autumn. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the plant.

AGALMYLA STAMINEA, *Blume* (long-sta-

mened Agalmyla).—Gesneraceæ § Cyrtandrea-Didymocarpidæ.—The generic name of this plant is derived from two Greek words, which signify "wood ornament" in allusion to its decorating the woods where it abounds with its showy blossoms. It is one of the best plants of this class of stove plants which has been introduced for some time past. The habit of the plant is robust, the creeping perennial stems rambling about the trunks of trees, rooting as they go; both the stem and petioles are densely hairy. The leaves are large, alternate, oblong acuminate, denticulate and downy on the edges as well as beneath. The

flowers are disposed in dense axillary fascicles, and are both large and very numerous; they are tubular, and curved with a spreading limb, of a rich crimson colour, and velvety surface; the limb is marked with dark blotches; each flower has two stamens, which project considerably. Native of Java, growing in the mountain woods. Introduced in 1846. Flowers in autumn, probably at other periods. It is the *Justicia parasitica* (Lamarck); and the *Cyrtandra staminea* (Vahl). *Culture*.—Requires a stove, but probably not extreme stove heat; light rich turfy soil; propagated freely by cuttings in a hotbed.



GARDENIA NITIDA.

Gardenia nitida, Hooker (glossy-leaved Gardenia).—Cinchonaceæ § Gardeniæ.

Several new and very striking kinds of Gardenias have been, within a brief period, introduced to our gardens; and the older kinds, known by the name of Cape Jasmines, are held in especial esteem from their powerful and delightful odour. The present species is a new and very distinct plant from any other which is known.

It forms a dense compact sturdy evergreen shrub; a flowering plant sent to Sir W. J. Hooker, for the purpose of being figured, was but two feet high and three feet across, so that in the mere leafy state, without flowers, it is an interesting plant. The leaves are large, oblong lanceolate, tapering to both extremities, the base being extended into a short petiole; they are wavy, very glossy, and dark green above, and paler beneath. The flowers

are axillary, solitary, and stalkless; they are, moreover, large, white, and deliciously fragrant; the calyx tube is an inch long, slender, and cylindrical, with a limb of seven spreading obovate or spathulate leafy segments; the corolla tube is slender, cylindrical, slightly wider upwards, projecting much beyond the calyx, the limb consisting of seven very long oblong obtuse segments, which soon become reflexed, their margins being also reflexed; these give the blossoms a very distinct character.

Our only knowledge of the plant is derived from the account published in the *Botanical Magazine*, where Sir W. Hooker states that the plant had been received by him "from the stove of Messrs. Lucombe, Pince & Co. [of Exeter], who raised it from seeds taken from a dried specimen, gathered by Mr. Whitfield [natural history collector for the Earl of

Derby, who also introduced some other beautiful *Gardenias*,] at Sierra Leone. It proves to be a perfectly new and most distinct species, possessing handsome dark green, glossy foliage, flowers among the larger of the genus, deliciously scented, the calyx furnished with large leafy segments, the corolla of the purest white, its limb cut into seven long segments, which are soon reflected." "Though shrubby it is eminently suited for 'pot culture,' and deserves a place in every stove. It blossoms in October and November, and will probably be found to do so at other seasons."

There is one point in this account which may deserve especial mention—it was reared from a seed taken out of a dried specimen. It is, we believe, not the only plant which our gardens thus owe to the chance of such botanical specimens as contain seeds falling into the hands of persons who care to turn them to account. Many ferns have certainly been so raised, and that often in the greatest profusion.

The *Gardenias* flourish in rich turfy loam, well drained, and they delight in abundance of weak liquid manure when growing. To grow them successfully, they also require a hot damp atmosphere; and no place is so congenial to them as a brisk heated dung-bed. Cuttings take root pretty freely planted in sand, and placed in a similar situation.

PLUMBAGO LARPENTÆ.

Plumbago Larpentæ, Lindley (Lady Larpent's Leadwort).—Plumbaginaceæ § Plumbaginæ.

Blue-flowered plants, adapted for the flower-garden, are by no means numerous; indeed, excepting the few dwarf kinds of *Lobelias*, there is hardly a good blue-flowered half-hardy plant which can be employed for summer decoration; and these dwarf *Lobelias* are too small to occupy many positions where blue flowers are required.

What experience has been had in the growth of the *Plumbago Larpentæ* tends to the conclusion that it will prove all that can be desired as a bedding-out plant for the flower-garden, for which purpose its charming blue colour will render it quite an acquisition. Its adaptability for this purpose has in some measure been tested during the past season. In the *Gardener's Chronicle*, where the first account of it was published, and from whence our sketch is derived, it is stated, that, in the nursery of Messrs. Knight and Perry, of Chelsea, a plant in the open ground had, in the month of October last, produced 4,000 blossoms.

Our subject is a sub-shrubby plant, with slender zig-zag stems, which are covered with

scales and close-pressed hairs. Its leaves are obovate, and sharply pointed, tapering also to the base, and covered with minute scales on each side, the margins finely serrated and also fringed with hairs. The flowers grow in close terminal heads, and are of an intense violet or clear deep blue colour, marked with a little red in the throat; the plant, consequently, when growing under favourable conditions, becomes a very beautiful object. Besides these characteristics, others more minute, yet serving equally for the purpose of scientific recognition, are these:—the bracts or floral leaves, and the sepals or calyx segments, are perfectly smooth and shining, fringed with hairs (ciliated), but entirely destitute of glands.

It is a native of Shanghai, in China, where, however, it appears to be exceedingly rare. Mr. Fortune found it growing on the ruined ramparts of that city, but the Horticultural Society were not successful in raising it. To Sir George Larpent, Bart., is due the merit of introducing, and to his gardener, Mr. Eyles, that of successfully rearing and cultivating it. It was sent to Sir G. Larpent, by Mr. Smith, in the ship *Monarch*, Captain Duncanson, with the following memorandum, dated Canton, May 16, 1846:—

"No. 6 Mr. Fortune tried to get a plant of, but failed: yours is, therefore, the only one in England. It is very rare, even at Shanghai; and I found it on the city wall, growing out of the stone-work; it will, therefore, require good drainage. This is one of the most ornamental plants I have seen in China." The memorandum goes on to state, that the climate of Shanghai, though in 30° N. lat., is both very cold and very hot, the thermometer being sometimes as low as 30° in February and as high as 110° in August. From this it would appear that the plant is able to endure a considerable degree of cold; it ought, in fact, if it can be kept dry enough, to prove hardy in our climate, but this is scarcely to be expected; neither our climate, nor the circumstances under which it would usually be placed as regards moisture in the soil, would be likely to accord sufficiently with those of its native place. In our climate damp would certainly be the greatest obstacle to its successful preservation in winter. This overcome, there would be little further difficulty in its cultivation.

The *Plumbagos* flourish in any light porous turfy soil, but in none better than where sandy loam preponderates. The present species must be particularly well drained, and not too freely watered. It may be propagated by cuttings planted in sand, and set in a mild hot-bed: these cuttings should, as in the case of other bedding plants, be planted in the latter part of the summer, and kept over the winter

in greenhouses or dry frames until the following spring.

For pot culture it will doubtless prove a very desirable subject. It must, in this case, be regularly shifted into pots containing a compost in which turfy loam preponderates, not using very large pots, and having these



drained in an efficient manner. The plants should, while young, be well stopped back, the point of the shoots being removed as soon as practicable after they reach from two to three inches long; this is to be continued until a good round head of branches is produced, and the plant should then be allowed to grow on for flowering. An allied kind, *P. capensis*, forms a very elegant plant under good management, and becomes a really desirable object for greenhouse decoration, from the distinct and soft pale blue colour of its blossoms; this species being, moreover, of rather straggling habit, may be used as a semi-climber; trained against the upright pillars of a conservatory, in situations pretty well exposed to light, and where its roots are in a healthy medium, it becomes very ornamental. Whether or not the new species will assume any of this habit, we know not; but the plant which appeared at one of the metropolitan exhibitions certainly indicated a more compact and bushy habit. Of course, as a pot plant, it must be very carefully watered.

THE FOREST TREES OF BRITAIN.*

BY THE REV. C. A. JOHNS.

THERE is nothing that would contribute so much to the improvement of old plantations, and the formation of new ones, as the knowledge of the habit, character, culture, and management of the trees which thrive in this country; and we hail with pleasure the publication of everything calculated to familiarize the generality of landowners and landholders with this important subject. Many who have laid out immense sums in planting, have altogether failed in their object, and the causes have been various; some from a thorough ignorance of the sorts likely to flourish, others from a mistaken notion that planting is planting, and that trees are to be chosen according to the owner's, or rather the planter's, fancy. There have also been not a few who have imagined that when trees are planted their duty is over, and that they have no more to do. We know of nothing therefore so essential as a full acquaintance with the requirements, as well as the comparative value, of the numerous plants which may be used, that the planter may choose judiciously, according to the soil and situation of his land; and when he has chosen, use all the means that are required to grow them to the best advantage. The subject has been often treated well in the *Horticultural Magazine*. Mr. Grigor's papers on many Timber and Ornamental Trees have been of the greatest service, so far as they went; but he has not written upon a tenth of the kinds that are applicable to the various earths that prevail in this kingdom. The first volume of the work before us is an attempt to supply all that is wanted, and it is published for the society which has ushered many a useful work into the reading world, the "Society for Promoting Christian Knowledge." With ample means of providing the highest talent, and, generally speaking, "in the multitude of counsel, wisdom" to engage it; a work of any kind has no small advantage when got up under their auspices. In this volume we have good evidence of both. In a general way, the descriptions of the trees, their peculiar characteristics, and the localities in which they flourish are sound. The illustrations are not only natural, but engraved in the most effective style; some of them are highly finished, and the majority may be considered worthy of a place among the best of the highest class. Some of the sketches are exceedingly interesting from the fact of their being portraits of existing specimens of notoriety. The author seems quite aware of the importance of his task; he says:—

* Published by the Society for Promoting Christian Knowledge. Two vols. 1847.

"The author's object in preparing these little volumes, is to furnish the lover of nature with such information respecting the trees which are either natives of Great Britain, or naturalized in it, as will tend to impart additional interest to his wanderings in the country. The reader, therefore, must not expect to find the announcement of any botanical discovery, any suggestions of new methods of planting, or recommendations for the improvement of timber. If he desires information on these points, he is referred to the numerous excellent works already in existence which treat on these subjects. But if he be merely desirous of exploring the wonders of nature as it is displayed in the more stately vegetable productions of his native country, it is hoped that he will find in the following pages, not, indeed, enough to satisfy his curiosity, but to stimulate him to fresh research. The author assures him that even his own slender amount of scientific attainments can crowd the hedges and by-ways with countless miracles, which for the untrained eye have no being.

"Scarcely any country in Europe is so favourable to the general study of the trees of temperate climates as England; for, without going so far as to assert that the number of native and introduced species exceeds that of all other states, it may be said with safety, that, whereas in most other countries the rare kinds are almost exclusively confined to botanic gardens and public institutions, the wealth and good taste of the English gentry procures for all trees worthy of introduction, and adapted to the climate, admission into the numerous parks with which the whole land is studded; where, without exception, for all purposes of observation and study, they are as much the property of the curious investigator, as of the lord of the soil himself. Scarcely a town in England is beyond a reasonable distance of some lordly demesne, abounding in fine specimens of most of our native trees, as well as many foreign ones, to the former of which the author hopes to introduce his readers in the following pages.

"Technical terms have been as far as possible avoided; but since, in describing the structure of a tree, it is necessary to apply to the several parts the conventional terms assigned to each part in scientific works, it has been judged advisable to give a general but slight sketch of the anatomical structure of a tree belonging to the class in which all the British trees are comprised."—*Introd.* pp. ix. x.

The introduction to the volume gives us as much of the physiology of vegetation as is necessary for the general reader; and the illustrations to this portion are acceptable, because they are not those common-place

examples that have become contemptible by their familiarity. The volume is not the work of a book-maker. There is no smack of the compilation which mars nearly all the modern works on gardening, botany, and even the treatises on simple subjects. It is a work after our own heart, at least as much so as any we have ever found. Any reader of the treatises which grace our volumes, will remember that they are never ushered in by long discussions on the locality of the plant, or speculations on matters which do not concern the culture. It has been too much the fashion to precede the actual matter that is wanted, by long and often tedious lectures on botany, that have been published a hundred times before. The author of the present work has given a very concise understandable sketch of the anatomical structure of plants, which we feel more than half inclined to quote for its intrinsic merit. It is true that under the head of "Introduction" he comprises a brief, but not a botanical, description of many of the orders, with examples and sketches, illustrating some leading tree belonging to it; but this is all new, it is a part of the subject itself. The portion of scientific matter, generally the most dry and the least interesting, is, as we have already observed, brief; and we like it because of its rare merit,—the condensation of much in little, and we cannot resist the temptation to quote a calm but sharp rap on the knuckles for the pompous but empty professors of the present day, and a just and dignified tribute to the genius of Linnæus, brought in, too, without any apparent effort, as the spontaneous effusion arising from a conviction of the great injustice done by the comparative worms of the present age to one of the greatest lights that ever shone on the natural history of vegetation. The author says, speaking of the organs of generation in plants,—

"On the number, relative lengths, combinations, and position of these essential organs, Linnæus founded his artificial system of the arrangement of plants, the *class* being for the most part decided by reference to the stamens, the *order* being dependent on the pistils. It is now unfortunately too much the custom to decry the system of Linnæus, and to speak of his time as 'the dark age of botany;' but its great inventor himself confessed it to be imperfect, and recommended it only as a substitute for some undiscovered system, which should associate plants of similar structure; his own method being open to the objection, that it brought together those which were not physiologically connected, and separated many which were closely related. Modern botanists have freely availed them-

selves of the discoveries of Linnæus, and have undoubtedly made considerable advances towards a natural system, against which this objection cannot be urged, but they have neglected to tender their acknowledgments to one who did more to dissipate the gloom in which the science of natural history was shrouded, than any, or even all, of his predecessors."—*Introd.* pp. xxiii. xxiv.

The natural orders are described very clearly, though not at great length. The single example of Coniferæ is as good as any for our purpose of showing the style in which it is treated; but it must be noted that this is only in the Introduction; when the trees are described individually, they are treated more elaborately. Of the order Coniferæ, the author says,—

"This order derives its name from the peculiar kind of seed-vessel, called a 'cone,' produced by the Fir and other allied genera. Conifers are distinguished by this character, by their needle-like leaves, by the vessels of their wood being perforated with numerous dots, and the apparently imperfect structure of the pistil in the perfect flower. 'No order can be named of more universal importance to mankind than this, whether we view it with reference to its timber or its secretions. Gigantic in size, rapid in growth, noble in aspect, robust in constitution, these trees form a considerable portion of woods or plantations in cultivated countries, and of forests where nature remains in temperate countries in a savage state. Their timber, in commerce, is known under the names of deal, fir, pine, and cedar, and is principally the wood of the Spruce, the Larch, the Scotch Fir, the Weymouth Pine, and the Virginian Cedar; but others are of at least equal, if not greater value. *Pinus palustris* is the Virginian Pine, so largely employed in the navy for masts. The gates of Constantinople, famous for having stood from the time of Constantine to that of Pope Eugene IV., a period of eleven hundred years, were of Cypress. The Norfolk Island Pine (*Araucaria excelsa*) and the Kaurie tree of New Zealand attain the height of 200 feet, and the latter yields an invaluable, light, compact wood, free from knots, from which the finest masts in the navy are now prepared. But they are both surpassed by the stupendous pines of North-west America; one of which, *Pinus Lambertiana*, is reported to attain the height of 230 feet; and another, *Abies Douglassii*, to equal or even to exceed it.' (*Lindley*.) Great though their value be as timber, they are yet more valuable for their copious secretion of substances useful in the arts and sciences. Pitch, tar, turpentine, resin, Burgundy pitch, Hungarian balsam, Canada balsam, &c., are furnished by some one

or more of these trees; and the seeds of the larger kinds are edible and nourishing. The Scotch Fir is a British example of this order. The Juniper, the berry-like cones of which are used for flavouring hollandais, extends over the greater part of Europe and North America, and is likewise found in some of the mountainous parts of Asia."—*Introd.* pp. lxxii. lxxiv.

With one quotation, which we shall select for its brevity, we shall close our extracts; but not without mentioning that the Oak—the glory of the forest—has nearly one hundred pages devoted to it, and so interspersed with historical records, legendary particulars, and engravings, as to form the most interesting part of the volume. The Mountain Ash is one of our most ornamental trees, and is as much esteemed for the showy colour of its fruit as for its flowers. There is perhaps hardly any tree that shows the author off to less advantage; but in some cases it is as well to show the least as it is the most interesting, when the object is to show merely the plan. It suits our limits just now, although at some future period we may be tempted to select some passages from the Oak.

"This universally admired tree chooses its dwelling, as its name would imply, in the wildest and most exposed situations, where, though impatient of being itself sheltered by any other kind of trees, it affords a friendly protection to grass and other plants which choose to grow beneath its shade. As long as it overtops its companions in the wood or mountain side, it is a vigorous and stately tree; but when it has attained its utmost height, and its more aspiring neighbours begin to screen it from its due share of air and light, it quietly retires from the contest, pines away in confinement, and suffers itself to be destroyed by the drip of the very trees that it formerly nursed and protected.

"Hence we rarely meet with a full-grown Mountain Ash in a crowded forest of ancient trees. Where it has gained the vantage-ground of a broken rock partially covered with rich, light soil, or taken its stand in an open glade, amid plants of humbler growth, it attains a considerable size. Or, again, in an elevated situation, uncongenial to the rapid growth of its companions, but well suited to its own wild tastes and habits, it will continue to flourish for a century or more.

"The Mountain Ash
No eye can overlook, when 'mid a grove
Of yet unfaded trees she lifts her head,
Deck'd with autumnal berries, that outshine
Spring's richest blossoms; and ye may have marked
By a brook side or solitary tarn,
How she her station doth adorn: the pool
Glows at her feet, and all the gloomy rocks
Are brighten'd round her.

WORDSWORTH.

"The Mountain Ash is placed by most modern botanists in the same genus with the Apple and Pear, the fruit of which it resembles in conformation.* Others assign it a place with the Medlar, (*Mespilus*), or make it and the group with which it is connected a distinct genus (*Sorbus*). The name "aucuparia" (from *auceps*, a fowler) indicates the use to which its berries are applied by bird-catchers in France and Germany, who bait their traps with them as a certain lure for thrushes and fieldfares. Its popular names are very numerous: Mountain Ash, the commonest, is far from correct, as it belongs to an entirely different tribe from the Ash, which tree it resembles only in its leaves; Rowan, Roan, its common name in Scotland, and various other forms of the same word, occur in old authors. It is also called Quick-Beam, Wild or Fowler's Service-tree: "Service" appears to be a corruption of *Sorbus*, the ancient Latin name of an allied species, *Pyrus Sorbus*. Witchan, Wicken, Wiggen, &c., evidently bear allusion to the power it was once supposed to possess of counteracting witchcraft.

"Lightfoot and Gilpin are both of opinion that the Mountain Ash was held in high estimation by the Druids. The former says, 'It may to this day be observed to grow more frequently than any other tree in the neighbourhood of those druidical circles of stones so often seen in the north of Britain; and the superstitious still continue to retain a great veneration for it, which was undoubtedly handed down to them from early antiquity. They believe that any small part of this tree, carried about them, will prove a sovereign charm against all the dire effects of enchantment and witchcraft. Their cattle also, as well as themselves, are supposed to be preserved by it from evil; for the dairy-maid will not forget to drive them from the shealings, or summer pastures, with a rod of the Rowan-tree, which she carefully lays up over the door of the sheal-boothby or summer-house, and drives them home again with the same. In Strathspey, they make, on the 1st of May, a hoop with the wood of this tree, and in the evening and morning cause the sheep and lambs to pass through it.'

"In ancient days," says Gilpin, "when superstition held that place in society which dissipation and impiety now hold, the Mountain Ash was considered as an object of great veneration. Often, at this day, a stump of it is found in some old burying-place, or near the circle of a Druid temple, whose rites it

formerly invested with its sacred shade.' The custom of planting it in burying-grounds appears to have been retained after the introduction of Christianity; for Evelyn mentions, that, 'in Wales, where this tree is reputed so sacred, there is not a churchyard without one of them planted in it, so, on a certain day in the year, everybody religiously wears a cross made of the wood.' In the Isle of Man, also, it is up to the present day invested by the superstitious with a sacred character. On Good Friday, when no iron of any kind must be put into the fire, and even the tongs are laid aside, lest any person should unfortunately forget the custom, and stir the fire with them, a stick of the Rowan-tree is used by way of substitute.*

"The belief in the efficacy of the Mountain Ash, as a preservative against witchcraft, has led some commentators on Shakspeare to substitute, for the puzzling expression in 'Macbeth,' 'Aroint thee, witch!' the words, 'A Roan-tree witch!' The passage being thus uttered, the mention of a tree so fatal to the power of the witch might naturally excite her acrimony against the person who applied the test. The authoress of 'Sylvan Sketches' quotes a stanza from a very ancient song, which runs as follows:—

Their spells were vain; the boys returned
To the queen in sorrowful mood,
Crying, that 'witches have no power
Where there is Roan-tree wood.'

"In remote districts of England the superstition has not even yet died away. Waterton, in his 'Essays on Natural History,' relates an anecdote which fell under his personal observation, of a countryman in Yorkshire, who 'cut a bundle of *Wiggin*, and nailed the branches all up and down the cow-house,' in order to counteract the effect produced on his cow by the 'overlooking' of a supposed witch.

"It is not a little singular, that, in like manner as we saw similar superstitious practices holding in Ireland and the East with regard to the Hawthorn and a tree closely resembling it, so we find in India a tree bearing a strong resemblance to the Mountain Ash, to which the same superstition attaches.

"Bishop Heber, in the 18th chapter of his 'Indial Journal,' gives the following account of this tree, and the superstition connected with it:—As I returned home, I passed a fine tree of the Mimosa, with leaves, at a little distance, so much resembling those of the Mountain Ash, that I was for a moment deceived, and asked if it did not bring fruit? They answered no; but it was a very noble

* The *Siberian Crab* (*Pyrus baccata*) produces fruit which may be considered as a connecting link between the berry of the Mountain Ash and the *Apple* of *Pyrus Malus*, the common Apple-tree.

* Train's "Historical Account of the Isle of Man, 1846."

tree, being called "the Imperial tree" from its excellent properties,—that it slept all night,* and wakened and was alive all day, withdrawing its leaves if any one attempted to touch them. Above all, however, it was useful as a preservative against magic; a sprig worn in the turban, or suspended over the bed, was a perfect security against all spells, evil eye, &c., insomuch that the most formidable wizard would not, if he could help it, approach its shade. One, indeed, they said, who was very renowned for his power of killing plants, and drying up their sap with a look, had come to this very tree and gazed on it intently; "but," said the old man who told me this, with an air of triumph, "look as he might, he could do the tree no harm!" a fact of which I made no question. I was amused and surprised to find the superstition which, in England and Scotland, attaches to the Rowan-tree, here applied to a tree of nearly similar form. Which nation has been in this the imitator, or from what common centre are all these common notions derived?"

"The Mountain Ash is found in a native state throughout the whole of Europe, and in several of the northern countries of Asia and North America. The parts of Great Britain where it attains its largest size are the Western Highlands and the western coast of Scotland. On the hills of Cheshire and Derbyshire it does not often attain a great size: in such situations an entire tree, with roots, leaves, and flowers, is sometimes found not more than nine inches high. Ordinarily it grows very rapidly during the first five years of its existence, and at the age of twenty years forms a tree of the same number of feet, with a single erect stem and a bushy head. The branches are smooth, and vary in colour from grey to purplish-brown. The buds, before their expansion in the beginning of April, are large and downy. The leaves consist of from seven to nine pairs of narrow, acute, notched leaflets, terminated by an odd one. These are somewhat downy underneath in their young state, but soon become quite smooth. The flowers are numerous, resembling in shape those of the Pear, but much smaller; in odour, those of the least fragrant varieties of Hawthorn. In early summer they are conspicuous from their number, and arrangement in large white clusters; when these are shed, the tree is still a pleasing object, from the brightness and elegant shape of its leaves. As autumn advances, it asserts its

claim to be considered a fruit-tree, in appearance, if not for utility. Its flowers are then succeeded by numerous bunches of coral-red berries, which, until devoured by the Thrush and Storm-cock, or scattered by the equinoctial gales, infallibly distinguish it from every other tenant either of the wood or the park. 'In the Scottish Highlands, on some rocky mountain covered with dark Pines and waving Birch, which cast a solemn gloom over the lake below, a few Mountain Ashes joining in a clump, and mixing with them, have a fine effect. In summer the light-green tint of their foliage, and in autumn the glowing berries which hang clustering upon them, contrast beautifully with the deeper green of the Pines; and if they are happily blended, and not in too large a proportion, they add some of the most picturesque furniture with which the sides of those rugged mountains are invested.'"

"A variety is cultivated which has yellow berries, and another with variegated leaves; but neither of these, as is the case with many other treasured rarities, has anything beyond its rarity to recommend it.

"The berries, besides being applied to the use from which the tree derives its name, 'Bird-catcher's Service,' are eaten in the extreme north of Europe as fruit, though not, one would suppose, until every other kind of attainable fruit is exhausted, for they are intensely acid, and possess a peculiar flavour, which makes them very unpalatable. In seasons of scarcity, it is said that they are sometimes dried and ground into flour. 'Some,' says Evelyn, 'highly commend the juice of the berries, which, fermenting of itself, if well preserved, makes an excellent drink against the spleen and scurvy. Ale and beer brewed with these berries when ripe, is an incomparable drink, familiar in Wales.' A beverage resembling perry is still made from them in that country, and is much used by the poor. In Kamtschatka and in the Scottish Highlands an ardent spirit is distilled from them, which is said to have a fine flavour.

"As a timber-tree, the Mountain Ash does not attain a size which renders it available by the carpenter; but its wood, being fine-grained, hard, and susceptible of a high polish, is used for smaller manufactures, principally in turnery. As coppice it may be applied to most of the uses of Ash, Hazel, &c.; and the bark is employed by the tanner. In the days of archery it ranked next to the Yew as a material for bows, and was considered sufficiently important to be mentioned in a statute of Henry VIII."—Pp. 277—286.

* Most plants of the *Acacia* tribe, which have compound leaves like the Ash, fold the leaflets together during the night, thus protecting their upper surfaces from the cold and damp. The same property resides in clover, and several other English plants of the same natural order.

We have simply now to give all praise to the general getting up of the volume. It is neat, and worthy of a place on the drawing-room table, as well as in the library. The

embellishments are amusing and instructive, many of them of deep local, and some of general interest; and we should like to see it in everybody's hands.



THIBAUDIA PINCHINCHENSIS.

Thibaudia pinchinchensis, Benth (Pinchinch Thibaudia), var. *glabra*.—Vacciniaceæ.

The genus *Thibaudia* is an extensive one, occurring chiefly in South America and Mexico, though, in some instances, native of the East Indies. Notwithstanding that it contains many plants of great beauty, comparatively few are known in a state of cultivation, a circumstance much to be regretted. It was named by Pavon, in commemoration of Thiebaut de Burneaud, who held the office of Secretary to the Linnæan Society of Paris, and was the author of some botanical memoirs. The species of *Thibaudia* are evergreen shrubs remarkable for the elegance of their blossoms.

Thibaudia pinchinchensis, which does not appear to be yet introduced in a living state, is a shrub with somewhat angular branches, oval-oblong acuminate leaves on short petioles, and axillary racemes of flowers, which are shorter than the leaves.

The variety *glabra*, represented in the engraving, differs primarily, as the name suggests, in being destitute of a certain degree of scurfy hairiness present in the species. It is an eminently beautiful shrub: in the flowering plant at Kew about two feet high, but growing several feet high in its native localities. The leaves are alternate, on short petioles, oblong-ovate, acuminate, between coriaceous and fleshy, and either entirely glabrous, or having only a very few short scattered paleaceous hairs; the nerves of the leaves besides the midrib, consist of two on each side from below the middle, generally but not always opposite. The flowers grow in axillary and sub-terminal racemes of from four to six or more together; the calyx, together with the adherent ovary, is red, turbinate, and quite glabrous, the limb cut into five short triangular teeth; the corolla is nearly an inch long, shaped like a slightly swollen tube, with a limb of five equal somewhat spreading teeth; it is of a waxy

texture, and deep rose-red colour, paler at the mouth: the whole flower, including calyx and corolla, all rose coloured, is rather over an inch in length.

The plant under notice was obtained from the elevated mountains of Columbia, whence seeds were sent by Mr. Purdie to the Royal garden at Kew, and also to Syon, at which last place it first flowered in a greenhouse, in September 1847. Mr. Bentham's *T. pinchin-chensis* was gathered by Hartweg, on the west side of Pinchincha.

It is a handsome greenhouse shrub, and should be grown in a compost of three parts turfy peat, and one part turfy loam, with an admixture of sharp silver sand, in sufficient quantity to render the whole mass porous. In regard to potting, they should be managed similarly to heaths; and it is best to give them moderate shifts into pots a size or two larger than those they are taken out of, rather than to place them in very large pots: like heaths, too, they must be well drained, broken charcoal being laid beneath and amongst the compost; and, moreover, they must be very attentively watered, so that *they never want*, nor are ever saturated. Cuttings of the young shoots, when they have become a little firm, take root, if planted in sand, and placed under a bell glass, in a moderate degree of heat.

GLENNY'S GARDEN ALMANAC.

THE present pocket volume is such a manifest improvement on all its predecessors, that, except for the usual lists of the best fruit, flowers, plants, and vegetables, and the plain, straightforward, blunt and somewhat uncourteous style, we should hardly recognise it. The calendar of the months, with the rising and setting of the sun and moon, and the aspects of the planets, are the most complete of all the almanacks of the year, and are perfect specimens of elaborate calculation and neat typography. There are some novel and useful tables, got up in excellent style, and a large quantity of miscellaneous useful matter. The predictions of the weather are new, and the Editor pretends to no other merit than that of having met the taste of the public for this kind of speculation, by employing the best talent that could be had for that department. There is an article on "The influence of the Moon on vegetation," which is so inviting, that we take the liberty of borrowing largely from it. The author of this paper says:—

"We certainly believe in the influence of the Moon, not only on the earth's atmosphere, but on the earth itself; not, however, on account of this 'opinion so universal and popular,' but from observation and experience. It is well known that there are hundreds of in-

telligent agriculturists who firmly believe in astral influence, and they are careful not to have their cattle castrated when the Moon is approaching, or on the meridian, or when she is in the zodiacal sign *Scorpio*, because they well know that the animal, in ten cases out of twelve, does not survive the operation. We could name two or three first-rate surgeons who will never perform an operation when the Moon is on, or near the meridian, or when she is in the zodiacal sign that rules the member which is to be operated upon. Ramsay, an author who wrote about the year 1650, speaking of the influence of the Moon, says, 'Moreover, there is no herb nor fruit, that is either set or sown in the wane of the Moon, but the taste thereof is neither so good as naturally the fruit is, nor so kindly; so also that vines may not spread and grow too fast, and be too forward, they are pruned and cut in the wane; and such timber or wood which we desire to keep long unwormeaten, we cut in the wane; for that then the Moon's light being abated, so is the sap and humidity of the tree, which causeth corruption being once lopt; thus much concerning what we would *not* have grow; but as touching such vegetables as we would have increase, it is but observing the Moon contrariwise, and we shall accomplish our desires therein; as if we be desired any thing should grow up in height, we take care she be at the time of setting or sowing thereof increasing in light and motion, and in an airy sign;* but contrariwise, if to take deep root and grow downwards, we place her in an earthy† sign.' Thus far Ramsey: now let us hear what Mr. Montgomery Martin says concerning lunar influence in his *History of the British Colonies*: 'In considering,' says he, 'the climate of tropical countries, the influence of the Moon seems to be entirely overlooked; and, surely, if the tides of the vast ocean are raised from their fathomless bed by lunar power, it is not too much to assert that the tides of the atmosphere are liable to similar influence; this much is certain, that, in the low land of tropical countries, no attentive observer of nature will fail to witness the power exercised by the Moon over the seasons, and over *animal and vegetable* nature. As regards the latter, it may be stated that there are certainly thirteen Springs and thirteen Autumns in Demerara in the year; for so many times does the sap of trees ascend to the branches and descend to the roots. For example, the *wallaba*, (a resinous tree, common in the Demerara woods, somewhat resembling mahogany,) if cut down in the *dark*

* The airy signs are ♊ (Gemini), ♎ (Libra), and ♒ (Aquarius).

† The earthy signs are ♉ (Taurus), ♍ (Virgo), and ♊ (Capricornus).

a few days before the NEW MOON, is one of the *most durable woods in the world* for house-building, posts, &c. ; in that state, attempt to split it, and, with the utmost difficulty, it would be *ripen in the most jagged and unequal manner* that can be imagined. Cut down another wallaba (that grew within a few yards of the former) at the FULL MOON, and the tree can be easily split into the *finest smooth shingles of any desired thickness*, or into staves for making casks ; but in this state, applied to house-building purposes, it *speedily decays*. Again,—bamboos as thick as a man's arm are sometimes used for paling, &c. : if cut at the dark moon, they will invariably endure for *ten or twelve years* ; if at the FULL MOON, they will be rotten in *two or three years* ; thus it is with most, if not all the forest trees. Of the effects of the Moon on animal life, very many instances could be cited. I have seen in Africa newly young *perish in a few hours at the mother's side*, when exposed to the rays of the FULL MOON. Fish become rapidly putrid, and meat, if left exposed, incurable or unpreservable by salt ; the mariner, heedlessly sleeping on the deck, becoming afflicted with nyctopia, or night-blindness ; at times the face hideously swollen if exposed during sleep to the Moon's rays. The maniac's paroxysms renewed with fearful vigour at the full and change ; and the cold, damp chill of the ague supervening on the ascendancy of this apparently mild, yet powerful luminary. *Let her influence over this earth be studied,—it is more powerful than is generally known.*

“ This is the testimony of a gentleman who speaks from actual experience, and who, in all probability, went to Demerara with as little faith in lunar influence as have many of our modern groping philosophers in England. Among the believers in stellar influence are to be found ‘ *some of the clearest-headed men in England.*’ Indeed it is no difficult matter to prove that some of the master minds of this and other countries were firm believers in astral influence. Such men, for instance, as Zoroaster, Josephus, Thales, Anaximander, Pythagoras, Anaxagoras, Socrates, Plato, Eudoxus, Hippocrates, Proclus, Pliny, Galen, Virgil, Horace, Claudius, Ptolemy, Mercurius Trismegistus, Haly, Alphard, Albumazar, Roger Bacon, Melancthon, Cardan, Lord Bacon, Tycho Brahe, Baron Napier, Cornelius Agrippa, James Usher, Archbishop of Armagh, Bishop Robert Hall, Dryden, Sir Matthew Hale, Sir George Wharton, Placidus de Titus, Sir Christopher Heydon, George Witschel, Astronomer Royal, Portsmouth ; Elias Ashmole, founder of the Museum ; Dr. Hutton, and Professor Simpson ; and hundreds more might be mentioned. We submit the

following to practical men, to be *disproved* if possible,—*fiat experimentum* :—

“ 1. Vines, if *pruned* when the Moon is *increasing* in light, will shoot out, spread, and grow fast, particularly if it be done in the *second quarter*, because, as the light of the Moon increases, so does the sap in the tree.

“ 2. Vines, if *pruned* while the Moon is *decreasing* in light, will not spread nor grow fast, particularly if it be done during the *last quarter*, because the sap decreases with the light.

“ 3. Timber cut down while the Moon is *increasing*, will soon become rotten, particularly if she be in the *second quarter*.

“ 4. Timber cut down when the Moon is *decreasing*, will last for years, and the more durable it will be if cut down during the *last quarter*.*

“ 5. Peas sown during the Moon's *increase* will bloom to the last, and will be full and rich in flavour ; still more certain if sown during the *second quarter*.

“ 6. Peas sown when the Moon is *decreasing* in light will be just in the opposite condition.

“ 7. The age to which a pomegranate will live depends on the Moon's age at the time of planting ; it will live just as many *years* as the Moon was *days* old.

“ 8. Plants and shrubs shoot up and take little root if planted when the Moon is *increasing* in light, and in the zodiacal signs Gemini, Libra, or Aquarius.

“ 9. If planted when the Moon is *decreasing* in the signs Taurus, Virgo, or Capricornus, they take deep root and do not grow tall.”—Pp. 23—26.

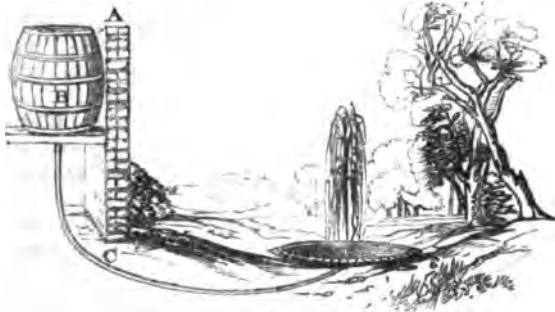
An article on the influence of light is equally interesting, but we must wait for another number and give it whole. A very extraordinary paper on sun-dials, and an especial notice of the sun-dial of Ahaz, has some claim to originality, and the examples of various calculations that interest the scientific world are worthy of notice. The list of fruits worthy of cultivation in every garden gives us a good idea of the tricks of the trade ; each fruit is given with its proper name, and to this is added all the other names by which the same fruit is sold by different nurseries, and in too many instances by a single dealer ; some of the popular subjects in apples, pears, peaches, and nectarines, have eight or ten different designations, so that a person, from a common trade catalogue, may order twenty-four kinds and find himself burthened by the same thing under many different names. The aim of the

* If our government would attend to this simple rule we should hear nothing of the *dry rot* in the British Navy, and a saving of from four to five hundred thousand pounds per year might be effected.

Editor is to lessen the difficulties of an amateur, by giving him a dozen or two of really good things, the worst of which is good, and so assist him in forming a collection of the best things only. The Calendar of Operations for each month in the year is not very materially altered from last year, but the lists are changed by striking out some of the worst and inserting some of the new things that have beaten them. To the amateur gardener it will be found absolutely necessary. There are some short notices of flowers, horticultural buildings,

trellises, rustic work, fountains, and other subjects, embellished with wood engravings. That on fountains we quote for its simplicity. It is very roughly illustrated by what appears a pen-and-ink drawing, and the artist has certainly not endeavoured to make the slightest improvement. This was thoughtless and unwise, because the subject is one in which there was room to make a pretty sketch. It is, however, just as useful as a diagram, and we give it to illustrate the paper, which is very short and to the purpose —

“SIMPLE METHOD OF MAKING A FOUNTAIN.



“By placing a water-butt at a considerable elevation, out of sight—as behind a wall, or in an upper room in an out-house, or any where else—and having a pipe from the bottom to any spot you like, you have a fountain: the elevation can always be increased by forming a valley below it. There is no difficulty in adding three or four or more feet to the rise of water, by sinking the ground into a hollow: then it should be also recollected, that by the jet being close to the surface, the stream of water is lengthened; for, if there were a design three feet high, it would be so much taken from the rise; say, a jet throws up six feet from the surface of the basin, a three-foot figure would only throw the same stream up three feet. This simple machinery explains that a fountain requires nothing but a head of water; and that, whether this is carried out with a tub or a reservoir of miles in extent, the principle is the same. But when water is laid on by water-companies, there is sufficient force for any thing; and it may be laid into the jets at once.

“A, section of wall; B, water-butt; C, pipe carried under-ground to fountain.”—P.94.

As we give our own list and description of new Dahlias, we shall not quote that feature, but the Editor gives us to understand that there are scarcely any first-rate varieties, and, from his description, there seems to be a number of flowers which may be classed as useful without any marked excellence. Upon

the whole, the Almanack for 1848 is by very much the best of the series, and the first in which the astrological portion has been worthy of the rest of the book, which contains a complete manual of gardening. The Editor is bent upon opposing certain people, for the sake of opposition, or his notions honestly differ from many. For instance, we observe that he boldly asserts that Mr. Whale's tipped flower *Delight* is the best flower of the season, although it was rejected altogether at the Surrey Gardens. He did the same by the *Marchioness Cornwallis*, and also by *Keyne's Standard of Perfection*, both of which were rejected in the same way, and by the same judges. He proved right in the other two, and may in this. But he was as much opposed to two other flowers selected for honours by the same judges. *Bianca* and *Model* were both pronounced by them to be first-class flowers, and he denounced them as altogether worthless; and in both instances he was right. The florists must account for these discrepancies their own way; we only state the facts.

CONTEMPORARY WRITINGS,
AND ORIGINAL NOTES CONNECTED WITH HORTICULTURE
AND NATURAL HISTORY.

LIQUID MANURE.—A good form of liquid manure may be obtained in the following manner:—Throw water over the fresh horse-dung as it comes from the stable, and allow the water to drain off into a tank near at hand; this water carries with it a considerable pro-

portion of the rich fertilizing salts contained in the manure. One gallon of this liquid, mixed with three gallons of soft well aerated water, is an excellent preparation for all plants requiring liquid manure.

PINUS BENTHAMIANA.—Mr. Hartweg has recently met with this species of pine in California; and, as it appears to be a new and distinct kind, has named it in compliment to G. Bentham, Esq. He describes it thus:—

The leaves of this species stand in threes, and are longer than the cones, usually eleven inches in length; the cones are five inches long, by two inches and a half at the broadest point, of a reddish brown colour, the centre of the scales terminating in a small sharp point bent downwards. The trees rise to the height of a hundred feet, with a stem three to four feet in diameter, producing the cones in clusters of three or four, which ripen in September, or in about eight months from the time of flowering."

TRAINING PEACH TREES.—Professor Du Breuil, of Rouen, proposes the following plan of training peach trees. A wavy central stem is first provided. When young this stem is bent first to the left and then to the right. Where it commences to turn from left to right, a shoot is encouraged on the outside of the bend, and trained straight to the left in a direction a little above the horizontal. Where the stem is again turned from right to left, another branch is extended to the right; and so branches are produced alternately on either side from every outward bend till the wall is covered. The systems recommended by Hitt and Hayward, introduced upright wavy main stems, but in both these there are two straight naked stems, proceeding in opposite directions, elevated at an angle of forty-five degrees, and four feet and a half in length, before these upright stems commence. The great objection to these plans is, that the long naked stems invariably become scorched on the exposed sides, from which the trees suffer severely. In the plan above noticed this objection is avoided; besides, the wall is furnished from top to bottom instead of being unfurnished in the lower four feet, as according to the systems of Hitt and Hayward. The method is recommended by Mr. Thompson, Superintendent of the Fruit department in the Horticultural Society's garden, as deserving of trial in Britain.

CHEAP FRUIT-TREE WALLS.—At Rouen may be seen a cheaply constructed wall for fruit trees, which might often be imitated where brick or stone walls would be considered too expensive. The wall alluded to has a stone foundation, carried up a little above the surface; the rest is composed of a mixture of clay, straw, and a little chalk—forming, in

fact, a kind of mud wall. These walls are found to answer the purpose at Rouen, and similar walls, when properly made, stand very well in our climate, and would doubtless be useful appendages to many gardens. The example above alluded to, at Rouen, is about eighteen inches thick, and ten feet high, and is surmounted by a coping of slate which projects several inches. It has been built six or seven years, and is in good condition. Such walls must, of course, be constructed in summer, so as to admit of their becoming well dried before winter. The trees must also be trained to wires or trellis work, as such walls will not admit of their being nailed to them.

SUBSTITUTE FOR TEA.—Mr. Neumann, one of the principal Superintendents in the Jardin des Plantes, at Paris, states, that, in the Mauritius, where he for some time resided, the leaves of *Aërides odoratum* are used as tea, a very few of the leaves being sufficient for infusion. Mr. Thompson, who records this in the *Journal of the Horticultural Society*, states, that he had supposed, when thus informed, that the plant was merely employed to impart a particular flavour to the tea, but was subsequently assured that the leaves of the *Aërides* were employed without any other along with them.

PINE APPLES IN THE OPEN GROUND.—At Bickton, in Devonshire, the seat of Lady Rolle, her ladyship's gardener, Mr. James Barnes, planted out, during the past spring, among the vegetables in the open garden, a quantity of pine apple plants which had attained a fruiting size; these plants were of different kinds, but chiefly of the variety called the Queen. Referring to these plants, in a letter dated about the end of June, Mr. Barnes remarks, that, "notwithstanding the cold and drenching rains, and the continued morning frosts, the fruit continues to swell beyond my expectation, and, if we get some sun, we shall have a lot of pretty fruit. Queens, according to present measurement, are likely to go from three to four and a half pounds." One of these fruits, sent to the exhibition of the Royal Botanic Society on July 7, weighed 4 lbs. 2 oz.; and though inferior, of course, to fruit swelled under more favourable circumstances, it was by no means a bad-looking fruit; the leaves and crown, however, were rather rusty. Mr. Barnes' experiment is not, of course, likely to lead to any results so far as regards the cultivation of pine apples out-doors—even in the climate of Devonshire; but it proves that they may be grown—and not unsuccessfully—in a lower temperature than is usually afforded them; and by the aid of cheap glass many persons might grow them in pits with comparatively little trouble and expense.

VEGETABLE FECUNDATION.—This is one of the unsettled points of vegetable physiology ; and theories almost diametrically opposed are maintained in reference thereto by “the doctors.” A general opinion is, that the pollen emits a slender tube, which, passing from the stigma to the ovary, conveys a material vivifying substance into the ovules ; and that, to effect fertilization, it is absolutely necessary for the pollen to be put into communication with the foramen of the ovule through the intervention of the conducting tissue of the stigma. A celebrated microscopic observer, Professor Amici, of Florence, has recently, by a minute examination of several species of Orchis, endeavoured to prove the existence of the essential part of the embryo anterior to the application of the pollen, which, according to him, acts as the specific stimulus to its development. This view receives great support from some singular exceptions to the general law of fecundation. Of these, the most striking occurs in a New Holland shrub, which has been cultivated several years in the Botanic Garden at Kew ; and which, though producing female flowers only, has constantly ripened seeds from which plants have been raised perfectly resembling the parent : while yet there is no suspicion either of the presence of male flowers in the same plant, or of minute stamina in the female flower itself, nor of fecundation by any related plant cultivated along with it. This plant has been figured and described in a recent volume of the Linnæan Society’s *Transactions*, under the name of *Cœlebogyne ilicifolia*, by Mr. J. Smith, the intelligent curator of the Kew Garden, by whom, indeed, this remarkable fact was first noticed. Male flowers of the *Cœlebogyne* have lately been discovered in New Holland, unquestionably of the same species. Professor Gasparini, of Naples, has more recently made various observations and experiments on the cultivated fig, which, though entirely destitute of male flowers, produced seeds having a perfectly developed embryo, independent of fecundation ; access to the pollen of the wild fig, generally supposed to be carried by insects, being, in his experiments, prevented by the early and complete shutting up of the only channel in the fig by which it could be introduced.

LARGE HAWTHORNS.—In an old farm-yard fence at Winmarty, near Garstang, the property of Wilson Patten, Esq., M.P., are some fine old trees of the hawthorn (*Cratægus Oxyacantha*). They are from thirty to forty feet high, with stems from twelve to fifteen inches in diameter. Specimens of so large a size as this are rare ; and must have a most beautiful effect when in bloom.

GOLD-STRIPED PERIWINKLE.—The only

hardy plant which approaches the tracery of the exquisitely marked *Anæctochilus setaceus*—whose leaves have not unaptly been compared to veins of gold flowing over a texture of green velvet—is the golden-striped variety of the greater Periwinkle (*Vinca major*), whose dark green leaves during the early spring and summer months are very finely marked with golden veins extending over their entire surface. The plant being perfectly hardy, thriving in ordinary soil, and vegetating early, will be found valuable for picturesque effect amongst early forced plants in the conservatory and greenhouse, or as portable specimens in pots for the open borders, either singly or otherwise. Its variegation is, in many instances, so beautifully distinct as to be adapted for the earliest bouquets of spring flowers.

POPULAR FLOWERS.—It has invariably happened to all modern races of Florists’ Flowers, that they have been the rage for a few years, and then have dropped in estimation as fast as they rose. Dahlias, pansies, calceolarias, are so many examples of this change of taste. From being universally admired, and exciting a little frenzy among gardeners, they now hardly draw a passing regard, unless their qualities are of a marvellous order, and hardly then. The secret is, that the varieties are too similar. The breeders of Pelargoniums may expect a similar loss of public favour, unless they can vary their sorts. The eye wearies of symmetrical forms which are all alike, except in the microscopical gaze of a profound connoisseur ; and when the novelty is gone, the Pelargonium, like other beautiful but insipid things, will be cast off and doomed to neglect.—*Gard. Chron.*

ECONOMICAL GREENHOUSES.—Mr. Rivers, nurseryman of Sawbridgeworth, has adopted a very inexpensive style of constructing the various buildings on his establishment ; and as similar erections might be turned to advantage in most gardens, whether large or small, it may be interesting to quote the annexed description of them from the *Gardener’s Journal*:—“Mr. Rivers has built extensive sheds with asphalté walls and roofs. He has also built sheds of various sizes with asphalté walls and glass roofs, in form resembling what are usually called lean-to forcing-houses. The front and back walls consist of upright posts of larch, cut once down ; one end is let into the ground, and the upper ends are cut even, and upon them a wall-plate is laid. These upright larch poles are two or three feet apart : the cut side faces outwards, and upon this is nailed a double coating of asphalté. The front wall is constructed in like manner, only lower, so that the roof assumes the ordinary slope given to greenhouses. In the front and back

walls are placed horizontal sliding ventilators, the roof being fixed. The wood-work in the roof consists of a series of uniform rafters, formed of deal quartering, three by two and a half inches; this, though of very large size, is rabbeted out by machinery, at the saw-mill, into the usual form of the sash-bars in ordinary glass frames. These rafters or sash-bars are fixed at the top and bottom, at twelve inches apart, and into them is fixed the glass in the usual way. Mr. Rivers finds these structures answer for horticultural purposes of every description,—even the forcing of Roses, Vines, and the most delicate of plants. A house fifty-four feet long by twelve wide, Mr. Rivers states, may be built, including every cost, for under 40*l*." In every garden where choice flowers are prized in the flower-garden, a building of this description would be just suited to raise a supply of plants to produce them; and wherever delicate, or early, or late vegetables were required, low buildings of this kind would prove invaluable. Of course, the buildings in the form alluded to above, are not very ornamental.

TROPÆOLUM TRICOLOR.—This plant is somewhat difficult to propagate, not that cuttings may not be readily induced to form roots, but the young plants thus raised are often very slow in producing those tubers by which the species is continued from one season to another. Seeds, though sometimes produced, are not always procurable. A certain and easy method of obtaining strong plants was, therefore, a desideratum. This is supplied by the following plan:—Place the bulb, when commencing its growth, near the bottom of a well-drained pot, and fill up with soil as the plant progresses, coiling the shoots three or four times round the inner side of the pot before they reach the top. The lower parts of the stems are thus for a considerable distance buried beneath the soil. Under this treatment, the plants grow vigorously, and, in the course of the season, several bulbs will be produced along the buried portions of the stem.

COLOUR FOR GARDEN STAKES.—This, though apparently a simple matter, deserves consideration. It is not unfrequent to see the sticks and stakes necessarily used to support the plants painted either a bright green or a light green, or sometimes even white. Now nothing can be worse than to employ bright and glaring colours; by contrast, under such circumstances, the foliage of most plants is seen to disadvantage, being rendered dull and uninteresting by the proximity of brighter tints. The most invisible colour that can be chosen is undoubtedly the best; and, perhaps, there is nothing that answers this description better—or even so well—as a dull olive-green. These remarks apply to all sorts of trellis-

work intended for plants, as well as to sticks and stakes. Even the material used for tying would be the better for being steeped in a similar colour.

PROPAGATING PINKS.—Those who require to propagate Pinks extensively for the flower-borders will find that the plan propounded some years ago, by Mr. Mearns, is more speedily performed, and is attended with as great success, as the wearisome and tedious mode of propagating by pipings. In applying it proceed as follows:—Choose a shady and moist situation, dig the ground, making it smooth and fine, at the same time adding some sand; this is all the preparation necessary. Take off the slips by pulling them downwards; do not dress them in any way, neither smoothen the rough end, nor shorten the grass; lay the slip horizontally on the surface of the ground, press the base into the soil in a doubled form with one hand, and set the top end upright with the other; let them be well watered, and the operation is completed. No shading is required.

NEW GRAPE.—Mr. Ingram, her Majesty's gardener at Windsor, has succeeded in raising a seedling grape of considerable merit. We are not aware that any name has yet been given to it. It was raised from the Muscat [of Alexandria?], impregnated by the variety called West's St. Peter's. The fruit is black, of a round form, with a thickish skin, sweet flavour, and about as fleshy as the Muscat. It is likely to prove a useful variety for late hothouse culture.

STANDS FOR STANHOPEAS.—It is usual to plant Stanhopeas in wire baskets, and to suspend them from the roof of the orchidaceous house: this is necessary, as the natural habit of these plants is to push their flower spikes downwards among their roots. This plan is inconvenient when it is necessary to remove the plants from one place to another. The following is a preferable method:—Select a portion of the trunk of a tree, six or ten inches in diameter, and of any form that may be preferred—that is, either simple or forked; cut the lower end horizontally, to form a base; the other end—or ends, if forked—is made bluntly conical, and upon the extremity of this cone the plant is fastened, just in the usual way of fixing these plants to blocks of wood: in due time the roots, embracing the trunk, fix the plants securely; and, the flower-stems meeting with no obstruction, are borne in their natural position, pushing through the mass of roots and the moss which surrounds them. These stands, of course, admit of the removal of the plants from place to place without any difficulty. They may, moreover, be made of any size or height required.

NEW STRAWBERRY.—Mr. Myatt, of Dept-

ford, well known as one of the most successful raisers of strawberries, has this season exhibited one which he considers distinct, and has named Eleanor. It appears to be very prolific, and is a handsome looking fruit. In form, it is bluntly conical; in size, rather large; in colour, light red, scarcely so delicate as the British Queen. The flavour is brisk, but somewhat acid, perhaps hardly so rich as some others.

APHIDES ON VEGETABLE CROPS, TO DESTROY.—The Aphides, or plant-lice, do much injury to vegetables when they attack them, and are suffered to get the upper hand. To remove them, dredge the plants well early in the morning, while wet with dew, with dry wood ashes, charred wood, or sawdust, or chimney soot, either of which will be distasteful to the vermin; the three together, however, have a most beneficial effect, not only in clearing away the nuisance, but also in adding to the fertility of the soil.

CABBAGE-ROOT MAGGOT.—The maggot which infests the roots of the cabbage, and other crops of the Brassica tribe, such as brocoli, cauliflower, kales, &c., and which, if left undisturbed, often destroys whole crops, may be dislodged by applying a liquid preparation formed by mixing wood-ashes and chimney-soot with water. A peck or more of soot and ashes may be mixed well in a hog-head of water; the ingredients should be well mixed, and then allowed to settle, and the clear liquor used. A good soaking application is necessary.

SEEDLING FRUIT, AND OTHER HARD-WOODED TREES.

MANY are deterred, by the long period that elapses between the sowing and coming to maturity, from attempting to raise subjects that would, nevertheless, well repay them for the trouble; but still the usual period required may be shortened by means that are easily applied. An apple-pip will be some years before it grows to a bearing tree. The apricot, peach, nectarine, cherry, pear, and other fruits, are, perhaps from the discouraging period of growth before bearing, all neglected alike; but say that seven years is the shortest period that maturity and fruit-bearing can be hoped for under ordinary circumstances, and that then ninety-nine of every hundred are worse than the parent, it is enough to discourage any but an enthusiast to attempt growing seedling fruit-trees. Let us set some young gentleman or lady a task, not an unpleasant one if there be ground at command. Get the finest specimens of fruit that can be had; or rather, as you come across any fruit remarkably fine, save the seed. If it be

cherries, save the stones; apples, the pips. No matter what it be—if a wonderful fine strawberry, peel off the outside, with all the seeds on it, and save it in a bit of paper; the rest is not the worse for eating for losing its skin and seeds; wash out the seeds from the pulp as soon as you get home, and put the seed on blotting-paper to dry. Raspberry, gooseberry, or currant, ditto; in short, no matter what fruit it be, if the specimens are remarkably fine, save the seeds. Gooseberry, raspberry, and currant (the latter, perhaps, is not worth the trouble), must be saved whole, and the seeds be obtained by squeezing the berry and washing out the juice and pulp, as directed for strawberries; place them on blotting-paper to absorb the wet, and when thoroughly dried put them in paper. If nothing remarkably fine comes in your way, seek them. Contrive to procure the finest apple, pear, plum, nectarine, peach, apricot, cherries, gooseberries, raspberries, and other fruit; a dozen apple-pips; as many pear-pips; cherry-stones and other stone fruit, half-a-dozen or a dozen each; and thus provided, get a small patch of good strong ground, plant in all the stones two inches apart, in rows six inches apart, and mark the ends of the rows, because it will enable you to clear away weeds between the rows without disturbing the seeds. The strawberry, gooseberry, and raspberry seeds must be sown as you would sow annuals; and as these seeds are to stand all the winter's rough weather, and the risk of being disturbed by vermin, place over the whole, cuttings of gooseberry-bushes, branches of thorn, holly, or other prickly subjects, not enough to exclude the light, but enough to prevent the intrusion of cats, fowls, &c. In the spring, some of these subjects will come up, and others will lay some time in the ground; but weeds must be cleared off as fast as they come up, and it can only be done safely by hand, for the hoe or spud may disturb the seeds and young plants. Let them be watered regularly all the summer, whether up or not, and continue to keep clear of weeds. If the strawberries, raspberries, and gooseberries are too thick, they may be carefully thinned, and the plants taken away and replanted in good, rich, strong ground, three inches apart every way, and that is about the distance to leave those in the seed bed. The time to thin these must therefore be when the plants are large enough to handle well, and this will get us fairly through the first season. It must be borne in mind that, when seeds are in the ground, they would be greatly risked if the soil in which they are placed were to be allowed to get dry, so as to evaporate any of the absorbed moisture from the seeds; therefore on

no account should watering in dry weather ever be neglected. Our next year's proceedings will be the subject of a second lesson; and in the mean time, secure seeds of anything very fine of the fruits that are from time to time laid before you.

THE AZALEA INDICA.

MUCH of the beauty of the Chinese gardens, in the early part of the floral season, is dependent on the numerous beautiful varieties of what are commonly called the Indian Azaleas, which they possess; and about the beginning of May, our own greenhouses and conservatories, as well as exhibition-rooms, bear ample testimony to their magnificence. A few years ago our gardens could boast of but few varieties of this particular plant: the old white; *phœnicea*, a purple; the double purple, with pale, almost lilac, flowers; and one or two others, were all that were in cultivation. Latterly, however, a numerous race of hybrids has sprung up, and we now possess varieties of very varied tints of colouring, as well as of a highly-improved form. The mission to China of the botanical collector of the Horticultural Society has added several new forms to this particular group of Azaleas; but while these in some degree extend the variety among these flowers, we already possess kinds of greater excellence, considered individually, than those which the Chinese gardens have afforded.

But much more might be, and no doubt will be, effected towards their improvement. There are very few varieties even yet of really good properties, and we may look ere long to see their characteristics united with other colours. The best varieties, as regards form, are the following:—*lateritia*, brick-red; *G'edstanesii*, white, usually slightly streaked with red, sometimes with flowers all white or all red, occasionally half red, half white; *variegata*, delicate flesh colour, with a paler margin. In these varieties the segments of the corolla are broad, so as to form a close, round, flattish, funnel-shaped flower. The brightest coloured kinds we have are:—the Chinese *A. obtusa*, recently introduced, which is of a rich brilliant crimson; and an English variety, called *refulgens*, with much larger flowers, of a similar or even brighter colour. In the absence of a pure white of perfect form, the old *ledifolia* (*indica alba*, as it is sometimes called), or some of the larger varieties, may be chosen. Neither is there yet any perfect forms of the deep purple colour of *phœnicea*; the variety *Triumphans* is of a kind of rosy purple, but much lighter than *phœnicea*.

The culture of the Indian Azalea is not

difficult, if one or two points are attended to. They do best in soil composed chiefly, if not entirely, of peat earth, in a rough turfy state, and mixed with sand in proportion to its degree of porosity. That kind of peat soil is the most proper for them which is of a light fibrous texture, and contains naturally a good proportion of clean sharp sand; this should be collected in the form of turves of three or four inches in thickness; and when used should be well broken down by the spade and hand, but not sifted, to remove the fibrous portions. For the strongest growing kinds, a slight mixture of loam is desirable, in the proportion of about one part in six or eight; a nice free mellow loam is the most proper to be employed. They require plenty of pot-room, and the pots must be efficiently drained, as they require to be liberally supplied with water, both when flowering and when growing. The best time to repot them is just after they have done blooming, which will generally be from the beginning of April to the middle of May. Plants which have bloomed very early, from having been forced, may be potted when about in the same state. By potting at this period the growth of the roots is excited, and they form themselves before and during the time of the growth of the shoots. When young plants are to be grown on into specimens, they may be prevented from blooming, and then potted and started into growth somewhat earlier, that is, during the month of March. Just previous to shifting they should be put into a house where they will be subjected to a moist genial atmosphere, and a temperature of from 50 to 55 degrees. While growing they require plenty of air and light, but not an excess of either; thus, for example, draughts of cold air must be avoided, as they are highly injurious; and very strong sunshine during the middle of the day should be kept from them by a slight shading, until the young shoots get pretty well matured, when they may have the full sun. Small plants intended to be formed into specimens, should not be allowed to flower for a year or two; or, at least, a more perfectly formed plant may be obtained by this arrangement. To effect this, the plants must be kept moderately dry in a cool greenhouse, for the winter; and then in the following spring submitted to a similar course of treatment. If it is desired to grow them on very rapidly, they may be potted again about July, when the first growth has been pretty well matured, having been first subjected to coolness and moderate dryness, and then placed in a warmer damp atmosphere, to excite a second growth. When this is attempted, the second growth should be completed early, so as to admit of being well ripened before winter. If it is not

thought desirable to push the growth of the plants so rapidly, they may be set out of doors about the end of July, into a place where they will be sheltered from strong winds, and exposed to the sun; the pots being plunged in moss, sawdust, or ashes, or otherwise protected from the drying influences of the sun and air. Throughout the growing season they require to be regularly supplied with water, but not over watered; in the winter, on the other hand, they must be kept somewhat dry, but not excessively so, or their leaves will fall off. In winter they may always be kept in a cool greenhouse, in which just warmth enough to exclude frosts is maintained. Older blooming plants, after they have done flowering, must have all the old flower-stalks removed, except where seed is required, and then they must be repotted and set to grow, and treated in the same manner as the other plants.

The Indian Azaleas are excellent plants for accelerating into early bloom for the decoration of the conservatory during the early spring. For this purpose, early and well-ripened wood must be secured; this must be effected by exciting the plants into growth early in the spring previous, so that their growth may be completed by the middle or end of August, when they are to be exposed to a sunny situation out-doors to ripen their wood. Early in the autumn they must be set in the greenhouse, before they are at all injured by frost. By the beginning of November some of the plants which have their flower-buds in a forward state, may be removed to a warm and light part of a stove or flower forcing-house, where they will be subjected to a temperature varying between sixty and seventy degrees by day, and eight or ten degrees lower by night; if they can be accommodated with from seventy-five to eighty degrees of bottom heat, so much the better. A week or two before these plants are ready to expand their blossoms, others should be introduced; in doing which those plants should be selected which, from the enlargement of their buds, are evidently in a state susceptible of excitement. It is a good plan, where the early blooming of these plants is an object, to raise a stock of some of the most distinct colours, and grow them for this purpose, reserving the finer specimen plants for blooming at the natural season.

The Azalea may be propagated by cuttings of the young shoots, taken off when they are about two inches long and scarcely half ripened; they must be planted in sand, and placed in the influence of a gentle bottom heat. They may also be rooted from layers, but these do not form such handsome plants. The finer and more delicate varieties flourish best when grafted or inarched on stocks of the

stronger and freer-growing kinds, or even on healthy, kindly-growing stocks of the common *Rhododendron*.

The Azaleas ripen their seeds early in spring—that is, in February or March, about which period they should be sown. Being very minute, they require somewhat careful management to ensure success. The pots must be half filled with materials for drainage, and the peat earth employed must be mixed with at least a third part silver sand; with this the pots are to be filled to within half an inch of the top, the soil being pressed down evenly and firmly. The seed is then to be sown very thinly, and just covered by a dusting of very sandy peat, or even pure sand, forming as thin a coating as will suffice to just cover the seeds. The pots are to be set on a shelf in the greenhouse, and are to be thus shaded until the seeds begin to germinate:—lay a piece of glass over the top of the pot, and on this glass a layer of moss kept constantly damp. When the plants begin to spring up, the moss may be reduced in quantity, and shortly dispensed with altogether, and the glass likewise in a short time afterwards. The seedlings are to be pricked out into other pots, in sandy peat soil, as soon as they can be conveniently handled; and subsequently are to be potted separately into small pots, and treated as other young plants.

HORTICULTURAL LITERATURE.

HAMILTON ON THE PINE, VINE, AND CUCUMBER.—Without going to the length of asserting that Mr. Hamilton is without an equal among the writers of modern times on particular branches of gardening, we may venture to set him down among the very few who have given us very useful lessons, and shown that they have something like original notions. The book is valuable on many accounts. In the first place, upon the subject of the pine-apple, we have a short abstract of all that has been written by the principal cultivators of this fruit, or rather of the leading points in their various practice, as a prelude to that recommended by the author—a practice since carried out with the greatest success by many gardeners, and worthy of attention by every grower for private families; for it is not quite the same with gentlemen's gardeners as with the growers for sale. The former wants to cut a pine the year round comparatively, while the latter has to drive them in at the season when they bring the most money at market. Mr. Hamilton's culture brings a sucker to fruit earlier and better than by any of the ordinary methods, and we have seen the system work well in several private gardens. By his method, the sucker is not taken from the plant at all,

but is earthed up, and it shows the benefit of it in an early development of its fruit. With regard to the vine and cucumber, we have only to remark that the amateur will not be deterred from attempting their culture by any real or pretended difficulties. The author can be understood by a novice, and we may add that there is no waste of words. There are few works on gardening, or any of its branches, that have the same merit of conciseness in so great a degree as the author's little volume. A second edition has been published, with additional information.

EVERY LADY HER OWN GARDENER.—Let not any one who has read the work of Abercrombie—"Every Man his own Gardener," fancy for a moment that the little book before us is like it. There is nothing to justify the title, or tempt any one to buy. "Every Lady her own Gardener" is the offspring of some feminine pen, which betrays all the weakness of the sex, and we had nearly said the vanity of inexperience and self-sufficiency. There is nothing new in it—not an idea but what has been worn to tatters in all the works from Miller's downwards; and it merely adds one to the hundreds of volumes that might be burned with great advantage. We do not wish to be severe where there is a shadow of originality or other value, but it is high time that a line were drawn between works of mere compilation and works of merit. Nothing but a novel and successful mode of treatment justifies any one in thrusting a work on the public, and adding to the multitudes of trashy "Guides," "Treatises," "Observations," "Remarks," "Instructions," and "Pamphlets," that surfeit even the patient reader of garden literature, as it is called. The little volume before us may be said, nay has been said, to be unpretending. This, however, merely amounts to the fact that the authoress does not presume, like another lady, to find fault with the very works she copies, as an excuse for giving us a worse. Still there was no occasion for it. There are plenty of books that would teach ladies gardening far better than this. In short, the abridgment of the History of England into a child's book would give as much notion of the subject as "Every Lady her own Gardener" will of horticulture. There are little works of a fourth of the price that contain four times as much useful matter, and, moreover, written by persons that write for the multitude who have but scanty knowledge, instead of spinning a subject into fine rounded periods of no meaning, and garnishing it with words incomprehensible to the million. We are the last to decry female talent, or to undervalue the efforts of a lady if the least useful, but there is a double blunder in this work. Had

it been written down a little more, and the title been "The Child's Guide to Gardening," we should have said nothing about it; but, with no pretensions to originality or novelty, to assume the title of the best work of the kind, and lead to a supposition that it was worthy of the same rank among females that Abercrombie's book was among men, was to thrust it into notice under a flag which it dishonoured.

THE GOOSEBERRY REGISTER.—This interesting little hand-book or guide to the gooseberry-grower is but partially known among the generality of gardeners, whether professional or amateur, but it ought to be in the hands of everybody who cultivates that favourite fruit. It is a complete register of the principal shows, with the names, weight, and colours of the winning berries, and is consequently one of the best possible instructors to all who intend purchasing the largest and best show varieties. It would appear, in a general way, that the heaviest berries win; that they are classed in four colours, red, white, green, and yellow, each competing together, and not one against the other. There are also notices of the new varieties to come out, and of shows appointed next year. Of course, the reports are, to those not in the fancy, very uninteresting; but there is a summary of each variety's winnings, and the weight of the heaviest that have been shown during the season. This summary is of far greater interest than the rest, and is worth the attention of any body who has room to grow a few of the most successful kinds.

THE ROSE AMATEUR'S GUIDE.—The only fault we find with this little volume is, that it is calculated, if not written, to induce persons to buy a few good roses that will please them, and a great many that are worthless; the common fault, and, we much fear, the too common object, of guides written by or for dealers. It contains some very good hints as to the general culture of the rose, and a sort of classification of the different families, which, however, is becoming less useful every season, inasmuch as the family distinctions are rapidly fading away, and the rose-growers themselves, in many cases, do not know with which family to class some of the new varieties. By-and-by we shall have something more rational than the present classification, and roses will be distinguished by their striking peculiarities instead of their real or supposed parentage. The moss, the China, noisette, climbing, and summer or June roses, are plain enough, but whether a rose is a hybrid China, a Gallica, or a Provence, is of *such importance* (!) that doctors differ as to which a new one belongs to.

THE GARDENER'S MONTHLY VOLUME.—THE DAHLIA.—This is one of those laboured productions which are made out of older and better works. Whatever quackery assumes a new form goes down for its time; and it is not to be denied that the number of short-sighted, weak-minded people, who, like children, are “pleased with a rattle, tickled with a straw,” so far outnumber those of common sense, that the folly and worthlessness of a thing are no bar to success. There is not one useful hint in this long rigmarole that has not been published before in a much better and more understandable form. This is a good deal to say, but we do not venture facts without proofs being at hand. Years ago, all that was useful in the culture of the Dahlia was published in one moderate Treatise, without a waste sentence or a useless engraving. The twisting about of words and paragraphs, and going into elaborate details about trifles, are worthy of bookmakers by profession; but we should like to know whether, when men addicted to this kind of business reflect a little, they think it a creditable employment? Among the books which we propose describing and noticing, we find a series of the works before us, and most of them have the name of some grower, who thus consents to publish his own inability by putting on the leading-strings of Mr. Johnson, who is supposed to put the words into English for him; or, which is worse, makes known his willingness to sell the use of his name to a mere compilation from other men's works. The Dahlia affair is ushered into the world by the aid of Mr. Turner, a very successful grower, by whom the Editor professes to be assisted; and we are sorry to see so good a florist deceived as he must have been, to be drawn into the discreditable employment of a compiler's drudge. We, however, acquit Mr. Turner of any wilful plagiarism. We believe he has been applied to for his name, and that he may have read the work, to see if there were any thing improper in the directions; and that, seeing there was nothing to condemn in the practice, he considered his duty done. We will never believe, until we are compelled, that he would compile, and garble, and change the language of known sound writers, to pass off the same ideas, information, and instructions as his own. We consider such compilations so many public nuisances, mere licensed petty larcenies, and are sorry when we see a respectable name put down as the Editor's tool for such very discreditable work.

ROBERTS'S CULTURE OF THE VINE UNDER GLASS.—The principal use of this treatise, was to give us the general notion of what others recommended, and then Mr. Roberts's experience and practice; and in this he has done

some service. The greater part of his matter was given in an early volume of the Gardener's Gazette, and it is more than probable that to the reception it met with there, may be attributed the publication of this little volume. The principal fault we find with it is, the great unnecessary trouble imposed on the cultivator, from the formation of the border up to the thinning of the grapes. There is too much fussy detail to be useful, and it is a question whether the supposition that all Mr. Roberts recommends is necessary, would not debar many from attempting the culture, or induce a carelessness that would be nearly as fatal. Many who would gladly undertake the culture of grapes, if no more than the necessary trouble were recommended, would give it up in hopeless despair, if they could once be seriously impressed with the notion that Mr. Roberts's tedious and laborious tasks had really to be performed. Nevertheless, we cannot blind ourselves to the fact that there is a good deal of theory mixed up with the practice—abundance of speculation going down the stream with the sound part of the advice. We are always against increasing the apparent difficulties of science; men do the most service who simplify all operations. By the plain teacher who goes about anything the easiest way, a novice is induced to begin that, which would be a frightful task if laid down after Mr. Roberts's fashion. The author says too much, he passes a sentence of condemnation on his own work; he says, “in it will be found plain language and plain practice, (pirated from no one,) in which I have had great success.” Now, considering that many of the best growers that have attempted vine culture, had practised and written before him, he was merely recommending his plan against the many who had been known to excel, or he was improperly claiming originality. There is, however, something to be gleaned from the book, which we are bound to say is not so original in the ideas as in the language.

THE MUCK MANUAL.—This exceedingly useful volume has furnished the contributors to farming newspapers with ample food for their hungry pens and ambitious notions. Those who will take the pains to read the work carefully, will find an immense store of really useful information to the farmer, and he will recognise the original facts and lessons upon which the Farmer's Gazettes, Journals, and Magazines, all over the country, have founded most of those papers that have sustained their otherwise empty title to support. There is scarcely a new fact to be sifted from works published since the Muck Manual appeared, at least upon those subjects which the volume professes to contain; and probably upon the

subjects of farm-yard, farm dressing, and the matters immediately relating thereto, there cannot be found in the same compass so much useful information to the farmer. We were well satisfied with the portion which may be called the book; but the appendix is (like a lady's postscript, which is more important than the letter,) more valuable if possible than the work, yet it seems merely a classification of the matter. It bears upon the same subject; it illustrates the opinions; it is a collection of great facts which convince the reader that the chapters he has read contain good information, and sound reasoning. We have profited by the lessons we have learned from the Muck Manual,—the information about guano as well as all other sorts of dressing for farms and gardens. The appendix contains trials and results of various experiments, some very conclusive, others deficient of positive evidence; but the whole are highly useful, and will be found particularly so by those who have been puzzled by the empty scribbling of people who want to palm off what they read in works of this kind for their own.

GLENNY'S PROPERTIES OF FLOWERS AND PLANTS.—This volume contains all the properties of flowers that Mr. Glenny has ever written. It comprises a very plain description of all those qualities and appearances which constitute the perfection of flowers and plants; and by a reference to which, any lady or gentleman, however little acquainted with flowers, may always select the best from any number or variety. No person should ever buy a plant without consulting this work.

DAPHNE FORTUNI.

Daphne Fortunei, Lindley (Mr. Fortune's Daphne).—Thymelacææ.—This plant is one of the recent acquisitions from China. It is a small shrub of great beauty, and in the garden of the Horticultural Society, at Chiswick, has proved itself to be perfectly hardy, having stood in the open border during the winter of 1846-7, and retained its shoots perfectly uninjured to the very points. On the Chekiang hills, where Mr. Fortune met with it, Fahrenheit's thermometer often sinks to within a few degrees of zero, so that there need now be little apprehension of its being injured in our climate, if placed under circumstances in an ordinary degree favourable.

It forms a small downy branched deciduous shrub, with thin opposite and alternate ovate-oblong and oblong leaves, covered with very soft fine hairs. The flowers are arranged in clusters of four upon the branches, when scarcely beginning to put forth their leaves; they have a slender tube more than an inch long, covered externally with soft closely

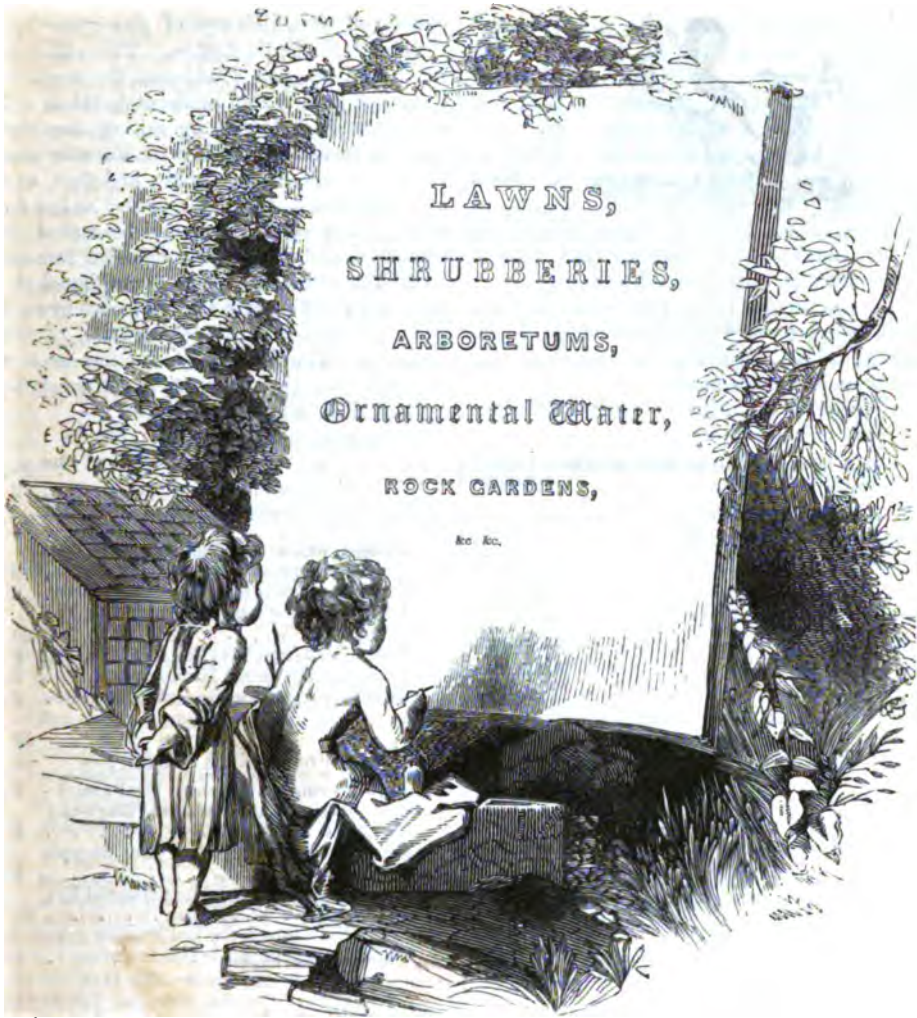
pressed hairs, and divided at the border into four roundish oblong obtuse uneven lobes, of which the two inner ones are the smallest; their colour is a pale bluish-lilac, and they are produced in the early spring.

We cannot discover any evidence whether or not this species bears fragrant flowers, though, from the circumstance of its near ally, *D. Mezereum*, being remarkably sweet scented, and most of the other kinds more or less so, it is probable that this kind also has sweet-scented blossoms. Some of the greenhouse daphnes possess the fragrant property in a remarkable degree; and it is also shared abundantly by several of the hardy species.

Mr. Fortune states, that he first met with it in a nursery garden near Shanghai, in the winter of 1843. He goes on to say: "When I returned to the northern provinces, in the spring of the following year, I found it wild on many of the hills in the province of Chekiang. It here forms a dwarf deciduous shrub two or three feet high. Like the English *mezereum* it is the harbinger of spring. In March and April the flower buds expand, and then the whole of the hill sides are tinged with its beautiful lilac coloured blossoms, and have a very gay appearance. Before they fade, the azaleas, as if in floral rivalry, burst into bloom, and give those northern Chinese hills a description of beauty peculiar to themselves. Its Chinese name is *Nú-lan-ée*. Like the *mezereum* of this country, its bark is extremely acrid and poisonous, and is used by the natives to produce blisters on the skin, particularly in cases of rheumatism."

It is found to be very easily cultivated. It grows with ordinary care, if potted or planted in a loamy well-drained soil; and may be propagated readily by means of cuttings, or by grafting on other deciduous hardy kinds of daphne. The main points to be observed in its cultivation are, to secure it a well-drained soil, to expose it fully to the sun when forming and ripening its wood during the summer months, and to give it a period of rest during winter when the leaves have fallen: this course of treatment will, under ordinary circumstances, result in producing a fine display of bloom in the spring. If, however, while the same course of treatment is observed, the resting state is induced in the autumn, or early in winter, the blossoms may be readily enough excited to develop themselves, by the aid of artificial heat, at any period of the winter. There can be no doubt of its forming a most desirable plant for forcing into early bloom, and as such it will be valuable to those who practise the forcing of flowers.

The Daphnes belong to the natural order Thymelacææ; and in the Linnæan system rank under Octandria Monogynia.



THE FORMATION OF LAWNS, SHRUBBERIES, AND ARBORETUMS.

The first operation is to have the whole of the area thoroughly and deeply drained. The next is to have the intended outline and elevations arranged; and then the position and boundaries of the intended clumps of shrubs, should be indicated. When this is completed, the preparation of the ground for the lawn and for the shrubs may proceed independently of each other.

Lawns. There are two ways of forming lawns, both of which have their advantages; the one is to lay down turf, procured generally from waste land, when the sward is compact; the other is to sow grass seeds to form a sward. In either case the preparatory operations are similar. The ground is first to be dug over roughly about a foot deep, and all perennial weeds removed; this may be done at any time of the year; the early part of spring is very suitable. Advantage must

then be taken of that condition of the soil when the clods break freely, which is when they are in a medium state of dryness; and the surface must be wrought over carefully by the spade, the clods broken, and the soil rendered fine and even. This is to be followed by going over the ground with a coarse wooden rake, such as is used in the hay-fields, and with it breaking and beating the surface to a finer tilth. Slight showers, alternating with drying winds, facilitate these operations.

The object of these labours is to render the soil even, and at the same time solid and tolerably fine, so as to secure a smooth and even surface. It is seldom the soil requires any addition in the way of manure, as this only tends to make the grass grow rank, and increases the labour of mowing; if it is very poor or sandy, a little manure, nearly spent, may be put on the surface, and incorporated

by raking with the upper soil ; and if the soil is naturally rich, a layer an inch in thickness of road sand or coal ashes, or of sandy peat, placed immediately under the turf, will serve to check some of its luxuriance. The turf should be selected where the herbage is fine, close, and without coarse grasses. Such turf is usually met with on chalky wastes, or indeed on waste lands in many situations. The turf obtained from meadow land, though perhaps more frequently used than any other, near the metropolis, is the very worst that can be had, being formed chiefly of coarse kinds of grass, which always grow rank, and can never be kept close and neat. If no other turf than this can be obtained, it is certainly better to procure and sow a proper selection of seeds. The turves are cut of an even size and thickness, about an inch and a half or two inches thick, one foot wide and three feet long. As they are cut they are rolled up closely, to facilitate removal. In laying them down it is proper to commence at the edge, placing them an inch or so beyond the true edge, so as to admit of their being subsequently cut or pared perfectly even. The turves are taken separately, laid down, and unrolled, so that the edges and ends fit firmly against the adjoining ones, and this is continued until the space is covered. The ground having been made even on the surface, and the turf cut of equal thickness, it will be evident that when laid down thus it will present an even surface ; but this is rendered more so, and the whole work is at the same time consolidated, by the use of a "turf-beater," a short slab of heavy wood, with a smooth face downwards, set obliquely, with a handle long enough to admit of its being used by a man standing upright. With this the turf is beaten firm and smooth, and the operation is then complete, except it may be necessary to add water in dry weather. The grass should not be too closely mown during the first season, but will be much benefited by frequent rolling.

Where the sward is to be formed by sowing grass seeds, the surface must be prepared as already directed. The edges must be made up firm and even, and cut to the proper outline, and then, within about an inch of the edge, a slight groove or drill is to be made, half an inch deep, and quite parallel with the edge ; this is done with the spade, the small portion of earth removed being cast inwards, or upon the ground to be sown. Along this groove a portion of seed is to be carefully and evenly deposited to form the edge. At the same time, about a yard inwards should also be sown. This part may be sown with a mixture of equal proportions of *Festuca ovina* (Sheep's Fescue grass), *Cynosurus cristatus* (Dog's-tail grass), and *Agrostis vulgaris* (common Bent-

grass), all of which are of fine growth, and form a close compact edge. The other parts must then be sown broad-cast, the seeds being deposited evenly and moderately thick. This operation is followed by raking the surface backwards and forwards with a coarse wooden rake, so as to cover the seeds, and then, as soon as the surface soil becomes so dry as not to adhere to the roller, it should be rolled down smoothly, and will require no other immediate care. The selection of grasses employed should vary with different soils, and may even be a good deal varied on the same soils, according to fancy. The following selection is a very suitable one, the proportions of seed being estimated for an acre of ground :—

For a light or sandy soil :—

	lbs.
<i>Avena flavescens</i> (Yellow oat grass) . . .	2
<i>Cynosurus cristatus</i> (crested Dog's-tail grass) . . .	4
<i>Festuca ovina tenuifolia</i> (fine Sheep's Fescue grass) . . .	5
<i>Agrostis vulgaris</i> (common Bent grass) . .	2
<i>Lolium perenne tenue</i> (fine perennial Rye grass) . . .	20
<i>Poa trivialis</i> (rough-stalked Meadow grass) .	8
<i>Poa nemoralis</i> (wood Meadow grass) . . .	2
<i>Trifolium repens</i> (white Dutch Clover) . .	4
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	42

For a soil of medium texture :—

<i>Agrostis vulgaris</i> (common Bent grass) . .	3
<i>Cynosurus cristatus</i> (crested Dog's-tail grass) . . .	6
<i>Festuca ovina tenuifolia</i> (fine Sheep's Fescue grass) . . .	5
<i>Lolium perenne tenue</i> (fine perennial Rye grass) . . .	20
<i>Poa trivialis</i> (rough-stalked Meadow grass) .	6
<i>Trifolium repens</i> (white Dutch clover) . . .	4
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	44

For a soil of a heavy nature :—

<i>Agrostis vulgaris</i> (common Bent grass) . .	4
<i>Cynosurus cristatus</i> (crested Dog's-tail grass) . . .	8
<i>Festuca duriuscula</i> (hardish Fescue grass) .	4
<i>Lolium perenne tenue</i> (fine perennial Rye grass) . . .	20
<i>Poa trivialis</i> (rough-stalked Meadow grass) .	8
<i>Trifolium repens</i> (white Dutch clover) . . .	2
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The perennial weeds should have been, as previously stated, removed during the preparation of the ground ; of most of these it should be remembered, that every small portion of the root will grow, therefore it is essential to remove them entirely. Annual seedling weeds, if they get at all large, so as to shade the grass too much, should either be pulled up by hand, or cut off at two or three inches high with a scythe. During the first season, the less the young grass is mown the better ; but it should be frequently rolled, especially when in a medium state as regards moisture. To

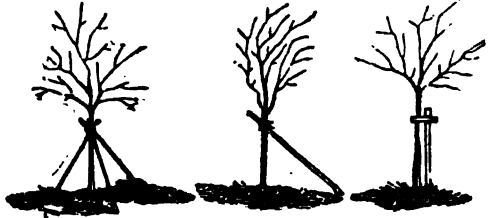
prevent the grass from getting too long, it may be mown about three times: thus, if sown, say in March, and has grown well, it may be cut about the end of June, the beginning of August, and the beginning of September, but this should not be done in hot dry weather. After the first year, it cannot either be mown or rolled too often; in fact, the thickness, fineness, and closeness of the turf depend entirely on the rigid performance of these operations during the growing season.

When lawns are laid down by sowing grass seeds, it is a much better plan to procure the seeds of the different kinds separately, and mix them carefully and thoroughly at the time of sowing; for it is rarely that what are sold as mixtures of grass seeds produce a fine turf. They consist for the most part of coarser and cheaper kinds.

Lawns ought at the least to be mown once a week from March to October inclusive. Mowing with the scythe is best done early in the morning, "while the dew is on the grass;" but when a mowing machine is used, it may be done with equal facility in the day-time. These machines perform three operations, namely, rolling, mowing, and clearing up the short cut grass. When the scythe is used, the operation of mowing must be preceded by rolling, which should be done the evening before, and is followed by sweeping up the short cut grass. During the winter, when mowing is discontinued, the rolling, sweeping, and poling should be regularly continued; the latter operation consists in levelling the worm casts by means of a long slender pole, and this operation should always be followed by rolling.

Shrubberies.—The position and outline of the shrubbery requires to be indicated and marked out partly by measurement, as in the case of the beds in flower gardens, and partly by the eye. When this is done, and the drainage is completed, the next step is to have this portion of the ground trenched, which may be done during the spring and summer, so as to be ready for the reception of the trees early in the autumn, which is the best general time for planting. There is nothing peculiar in the mode of planting trees and shrubs; but the more carefully the operation is performed, the more certain are the plants to "take" well with the soil and to thrive. One essential point is to have all the plants staked when planted; or at least all that are large enough to be swayed by the wind: inattention to this is the cause of many deaths among plants of this kind. When the trees are allowed to rock backwards and forwards, the roots are first drawn from their position, and then as the plant rights itself, or bends in an opposite direction, they are bent up, and in this way they are not only bruised but pre-

vented from striking fresh fibres, and in the mean time evaporation exhausts the plant. The best way to fix trees or shrubs firmly is to place three stakes diagonally about them, these being securely tied to the stem at the top; a piece of cloth or canvass should be placed between the stem and the stakes, to prevent their rubbing the bark. It may be useful to indicate other modes of staking.



A more economical plan than the last consists in fixing one stake so as to bear against the quarter which is most exposed to wind; this, of course, is sufficient while the wind remains in that particular direction. Another plan is to place down a stake perpendicularly, to pass a hand of straw round the tree, tying it between the stem and the stake, and again close beyond the stake; where slight support only is required, this plan is preferable, as it may be done very neatly.

Neither shrubs nor trees should be planted too thickly. This practice is a sacrifice of ultimate fulness of outline and perfection, to temporary and immediate effect. As, however, shrubs or trees of the size usually transplanted must, to produce any immediate effect, be placed thicker than they should remain, proper provision should be made for removing from time to time such as are not required. *No shrubbery, therefore, ought to be planted on any other principle than this; that the ultimate plants should be so arranged, that others may be planted to fill out between them, and removed when necessary without disturbing them or their arrangement in the least degree.* This cannot be done without first becoming acquainted with the habit of the trees planted.

When a shrubbery is first planted, the ground between the trees may be dug up annually in autumn, the surface hoed and cleaned during summer, and the edges kept evenly cut and trimmed; but in the course of a few years, when many of the super-numerary plants are removed, and the plants nearly cover the ground, it is considered better taste to avoid digging, and to allow the turf of the lawn to be continued inwards among the plants, so as to present no even edge or outline. In the interior parts, or where the shrubbery adjoins gravel, and grass could not well be introduced, it is better to

substitute dwarf evergreens, such as the ivy (*Hedera Helix*), or the periwinkle (*Vinca minor* and *V. major*), either of which would cover the surface, and present a better appearance than bare earth. The Tutsan (*Hypericum Androsaemum*) is another plant suitable for the purpose, and bears large golden yellow flowers in the midst of summer.

The beauty and effect of a shrubby plantation depends mainly on the selection and arrangement of the trees. Evergreens and deciduous kinds should be admixed, especially in the prominent parts, so that even in winter, when the latter have shed their leaves, the former may impart some life to the groups. So, likewise, plants with broad and large foliage should be intermixed with those which have leaves of a lighter character; those, also, which present dark hues should be associated with lighter ones. Then, again, plants which bear different coloured conspicuous berries should be placed with a view to effect by means of contrast, and so should those deciduous kinds, the leaves of which change colour towards the autumn, some time before they fall. Again, plants which bloom at different periods of the year should be distributed throughout, so that every part may be alike ornamented. But while in the arrangement of the plants all these various features should be distributed and intermixed, it must be done on principle; they must be *grouped*, for nothing would be worse than to have them as it were mechanically dotted at regular and formal distances. Here there is ample room for the exercise of individual taste. Of course it is only in those parts which are conspicuous, such as the front parts of large plantations, and detached clumps, that so much trouble need be taken.

The annexed classified selection of plants adapted for shrubberies, will assist in following out the plan here indicated; it is offered, however, merely as an illustration, and might be much extended.

EVERGREEN SHRUBS.

With large or conspicuous foliage.

Berberis Aquifol. (holly-leaved Berberry); 3 feet high; yellow bloom, April and May.

Ilex Aquifolium, many varieties (Holly); 10 to 20 ft. high; white bloom; May.

Cerasus lusitanica (Portugal laurel); 10 to 20 ft. high; white bloom; June.

Cerasus Lauro-cerasus (common laurel); 6 to 20 ft. high; white bloom; April.

Garrya elliptica (elliptic-leaved Garrya); 10 ft. high; greenish yell. bloom; Nov. to Jan.

Daphne pontica (Pontic Daphne); 5 feet high; greenish yellow bloom; April.

Yucca gloriosa (glorious Adam's needle); 6 ft. high; white bloom; July.

With small or elegant foliage.

Berberis dulcis (sweet-fruited Berberry); 3 feet high; yellow bloom; April.

Berberis dealbata (whitened-leaved Berberry); 3 ft. high; yellow bloom; March.

Cotoneaster microphylla (small-leaved Cotoneaster); 3 feet high; white bloom; May.

Phillyrea angustifolia (narrow-leaved Phillyrea); 8 feet high; green bloom; May.

Buxus sempervirens, many varieties (common Box tree); 10 ft. high; whitish bloom; April.

Buxus balearica (Balearic Box tree); 15 ft. high; yellowish bloom; July.

Several species of *Thuja* (Arbor-vitæ), *Cupressus* (Cypress), and *Juniperus* (Juniper), though, strictly speaking, small trees, might be added here.

With variegated foliage.

Aucuba japonica (Japan Aucuba); 8 feet high; dark bloom; May.

Buxus sempervirens, several varieties (common Box tree); 10 feet high.

Ilex Aquifolium, several varieties (common Holly); 10 to 15 feet high.

Cerasus Lauro-cerasus variegata (variegated common Laurel); 6 to 20 feet high.

Daphne pontica foliis variegatis (variegated Pontic Daphne); 5 feet high.

Yucca gloriosa foliis variegatis (variegated Adam's needle); 6 feet high.

With fragrant foliage.

Artemisia Abrotanum (Southernwood); 3 ft. high; yellowish bloom; August.

Rosmarinus officinalis (Rosemary); 4 ft. high; pale bloom; December and January.

Laurus nobilis (Sweet Bay); 15 to 30 feet high; whitish bloom; April.

Flowering early in the Spring.

Berberis nervosa (nerve-leaved Berberry); 3 feet high; yellow bloom; October to March.

Ulex europæa flore pleno (double-flowered Furze); 3 ft. high; yell. bloom; February.

Flowering late in the Autumn.

Arbutus Unedo (Strawberry tree); 10 feet high; white bloom; September to December.

Garrya elliptica (elliptic-leaved Garrya); 10 feet high; green bloom; Nov. to Jan.

Viburnum Tinus (Laurustinus); 8 ft. high; white bloom; December.

Yucca filamentosa (thready Adam's needle); 5 ft. high; white bloom; September and Oct.

Ulex nana (dwarf furze); 2 feet high; yellow bloom; August to December.

Conspicuous for their fruit.

Arbutus Unedo (Strawberry tree); 10 feet high; fruit red; December.

Cotoneaster rotundifolia (round-leaved Cotoneaster); 3 feet high; fruit red; August.

Ilex Aquifolium (common Holly); 10 to 20 feet high; fruit red or yellow; September.

Berberis Aquifolium (holly-leaved Berberry); 5 feet high; fruit purple; September.

Berberis repens (creeping-rooted Berberry); 3 feet high; fruit purple; September.

DECIDUOUS SHRUBS.

With large or conspicuous foliage.

Cotoneaster affinis (related Cotoneaster); 10 to 20 feet high; white bloom; April.

Salisburia adiantifolia (Ginkgo tree); 10 to 20 feet high; yellowish bloom.

Aralia spinosa (Angelica tree); 10 feet high; greenish bloom; August.

Viburnum cotinifolium (cotinus-leaved Viburnum); 8 feet high; white bloom; April.

Magnolia: several of the species.

With small or elegant foliage.

Tamarix gallica (French Tamarisk); 6 ft. high; pinkish bloom; May to October.

Myricaria germanica (German Tamarisk); 6 ft. high; pinkish bloom; June to September.

Comptonia asplenifolia (Fern-leaved Comptonia); 3 feet high; brown bloom; March.

Spiraea hypericifolia (Hypericum frutex); 4 feet high; white bloom; June.

Spiraea bella (beautiful Spiraea); 4 ft. high; rose-coloured bloom; June.

Colutea arborescens (arborescent Bladder Senna); 12 feet high; yellow bloom; June.

Coronilla Emerus (Scorpion Senna); 8 ft. high; yellow bloom; May.

With variegated foliage.

Hibiscus syriacus foliis variegatis (variegated Althea frutex); 5 feet high.

Ligustrum vulgare variegatum (variegated Privet); 8 feet high.

Philadelphus coronarius variegatus (variegated Mock Orange); 8 feet high.

Sambucus niger foliis argenteis (variegated common Elder); 12 to 20 feet high.

With fragrant foliage.

Myrica Gale (Sweet Gale); 3 feet high; greenish bloom; February.

Rosa rubiginosa (Sweet Briar, or Eglantine); 4 feet high; pink bloom; June.

Flowering early in the Spring.

Ribes niveum (snowy-flowered Ribes); 4 ft. high; white bloom; April.

Ribes sanguineum (red-flowered Currant); 5 feet high; deep rose bloom; March.

Syringa rothamagensis (Rouen Lilac); 6 feet high; purple bloom; May.

Syringa vulgaris, several varieties (common Lilac); 8 feet high; May.

Chimonanthus fragrans (fragrant Winter flower); 6 ft. high; yel. bloom; Dec. to March.

Amygdalus nana (dwarf Almond); 3 feet high; rose bloom; March and April.

Daphne Mezereum (common Mezereon); 3 feet high; red bloom; February to April.

Magnolia conspicua (Yulan or lily tree); 20 ft. high; white bloom; February to April.

Flowering late in the Autumn.

Ceanothus azureus (azure flowered Ceanothus); 6 ft. high; blue bloom; May to Sept.

Hibiscus syriacus, many varieties (Althea frutex); 4 feet high; August.

Leycesteria formosa (beautiful Leycesteria); 8 ft. high; whitish bloom; August to October.

Conspicuous for their fruit.

Berberis vulgaris (common Berberry); 8 ft. high; fruit red, &c.; September.

Crataegus, many species and vars. (Thorn); fruit chiefly red; September and October.

Daphne Mezereum (common Mezereon); 3 ft. high; fruit red; August and September.

Euonymus europæus (European Spindle tree); 8 ft. high; fruit scarlet; September.

Ligustrum vulgare (common Privet); 8 ft. high; fruit black, &c.; October and November.

Symphoricarpos racemosus (Snowberry tree); 5 ft. high; fruit white; Oct. and Nov.

Colutea arborescens (arborescent Bladder Senna); 12 ft. high; fruit bladder-like; Sept.

Ericacetum, or *American plants*.—A particular group of flowering shrubs, chiefly Ericaceous plants, is designated American shrubs. These are among the most beautiful and desirable of this class of plants, and should bear a large proportion to the whole number in every garden. They do best in what is called a peat soil, that is, such as the common heath grows freely in, and hence they are also called peat-earth plants, and are usually grown in separate clumps or masses, where the soil is specially prepared for them. These plants require a moist soil and sheltered situation, and many of them do well in partial shade: in fact, moisture is more essential to them than even peat-soil, for many of the freer growing species, such as Rhododendrons, Azaleas, Heaths, &c., will grow very well in a deep, free, loamy soil, provided it is moist.

Where the pleasure ground is sufficiently extensive, it forms an interesting feature to have the American plants in a detached group, similar to the flower garden and rose garden. A spot well screened from wind, and one where the soil is naturally moist, should be selected; and here the smaller and choicer kinds may form separate groups in the interior, while the hardier and commoner species are made to surround them. The plants which are understood by the term American shrubs, almost exclusively belong to the natural order Ericaceæ; and hence a collection of these is appropriately called an Ericacetum.

It is very appropriate to make the interior

of the *Ericacetus*, or American garden, a foot or more below the ordinary level, and to surround it by a bank of *Rhododendrons*. The outline of the area and the disposition of the beds and plants may be varied to suit circumstances and individual taste. If the soil is free and deep, of a loamy nature, it will not be absolutely essential to renew the whole bulk : in this case the situations for the most delicate kinds only should be entirely renewed, while the other parts receive an addition of one-half or more of peat-earth to be mixed with the soil. The proper course is this :—Have the spot drained so as to remove stagnant water : then, if the beds are to be renewed, simply remove the soil eighteen inches deep, and fill in two feet in thickness of peat soil, which should be broken up fine, and laid compactly together ; the beds are then ready for planting. If peat soil is to be added to the previous soil, remove a portion from six to eight inches in thickness of the worst, add the peat, and then let the whole be turned up about eighteen inches deep, and well mixed together.

Where peat earth may happen to be difficult or too expensive to obtain, the cultivation of American plants need not be given up ; for a very good substitute may be formed of tree-leaves, cow's-dung and sand. Two parts of leaf-mould, one of cow's-dung, and one of clean sand, will form a compost in which most of the American shrubs will grow very freely, when mixed with a greater or less proportion of sandy loam.

The following are the principal genera of this class of plants :—

Rhododendron ; many species and numerous hybrid varieties ; white, rose, purple and yellow, with all intermediate shades ; evergreen.

Azalea ; several species and numerous hybrids ; white, pink, rose, scarlet, yellow, and various intermediate tints ; deciduous.

Kalmia ; several species, and some varieties ; white and rose colour ; evergreen.

Vaccinium ; many species and varieties ; white and pink ; deciduous and evergreen.

Andromeda, with the six genera—*Cassiope*, *Cassandra*, *Zenobia*, *Lyonia*, *Leucothoe*, and *Pieris*—separated from it ; many species and varieties ; white or whitish and pink ; mostly evergreen.

Erica, *Gypsocalis* and *Calluna* ; several species and varieties ; white, pink, and rose ; evergreen.

Pernettya and *Arctostaphylos* ; a few species and varieties ; white ; evergreen.

Besides these, there are several less striking but equally beautiful smaller genera, which follow :—*Phyllodoce*, *Bryanthus*, *Dabæcia*, *Gaultheria*, *Epigæa*, *Phalerocarpus*, *Menziesia*, *Leiophyllum*, *Ledum*, and *Oxycoccus*.

Rosetum.—Roses are best cultivated apart

from other flowering shrubs, and they form a most interesting feature in the pleasure ground when kept in a separate group or compartment. Such a separate group is called a Rose garden, or Rosetum : it may consist of a single clump or bed, planted with a selection from the different classes of Roses ; or may be extended much beyond this, so as to provide one or more beds for each of the separate classes, or even for a number of select varieties. Instead of being isolated from the pleasure ground by a surrounding belt of shrubs, the Rose garden may appropriately occupy some convenient portion of the lawn, near the walks, being partially separated from the principal area of the lawn by groups of " pillar Roses ;" the latter must, however, be grouped on the same principal as single trees and shrubs are grouped ; namely, so as to avoid the appearance of formality from the different points of view. The hardy climbing sorts may be thus disposed of, and all the tender climbing sorts should be accommodated on the conservatory wall, or in some similar place near the dwelling. The Rose garden when thus situated on the lawn should always have a gravel walk running among the beds, so that it may be visited in damp weather. If preferred, it may be made entirely with gravel walks between the beds.

Roses require rich soil, of a free but rather strong loamy texture, and thorough and complete drainage is absolutely essential. In making a Rose garden, therefore, the soil must be well prepared. After the drainage is arranged, let it be trenched up two feet deep, and six inches of well-rotted hot-bed manure added, and well mixed throughout the soil. If the soil is a free loam, no other preparation will be required. Where the soil is poor and gravelly, and also where stiff and clayey, a portion of the worst, varying from a third to one half should be removed, and replaced by the nearest approach to turfy loam which can be obtained. It is absolutely essential in every case that the drainage be made perfect.

The beds should be filled chiefly with the dwarf growing varieties, those which produce very long shoots being more suitable for pillars and trellis work. Varieties of similar characteristics should also be planted together, thus Moss, Provence, and Damask Roses associate well together, but not so well with Noisettes, Chinas, and Bourbons. Those of the habit of the latter form very good beds when the main shoots are pegged down to the surface, the lateral shoots then rising and producing a dwarf close head of bloom. The beds should be bordered, if on grass, with the smaller Roses, such as the Rose de Meaux, and the Fairy Roses. If the garden is formed with gravel walks between the beds, edged

with dwarf box, these small Roses may be planted within the box-edging.

As in all other styles of flower gardening, much of the effect of a Rose garden depends on a good selection and arrangement of kinds. To prolong the blooming season, the earliest and latest varieties should be included; and their blooming may also be extended over a longer period by varying the time of pruning them. So also should the varieties of distinct colours be selected, especially for the beds, and these should be well contrasted, whether the beds are filled with one variety only, or contain a mixed group.

Arboretum.—An Arboretum, properly so called, is a botanical collection of trees and shrubs. Sometimes where there is abundant space, a large area is devoted to this object, and the trees and shrubs—usually one specimen of each species or variety—are disposed in picturesque groups. They are often, but not always—though they always should be—also ranged in groups which indicate their botanical affinity. The Arboretum, therefore, differs from the shrubbery in this, that the latter is planted with regard to collective effect—shelter, shade, &c., whilst the former is intended chiefly for individual representation,—to supply portraits of sylvan vegetation.

An Arboretum should be laid out as pleasure ground, that is, with lawns intersected by gravel walks, and scattered over with clumps and isolated individual trees and shrubs; and the latter ought to be grouped with a view to their effect as a whole. There is one very particular point in the arrangement of Arboretums which is often neglected. Different trees, it is well known, prefer different soils, and though most trees will grow in a good soil, yet it rarely happens that any natural kind of soil is equally suited to all kinds of trees, and hence some of the kinds do not prosper so well as others. It is also impracticable, beyond a certain preparation for young plants, to effect any material alteration in the nature of the soil in a matter so extensive as an Arboretum. In an Arboretum *every individual tree and shrub* is required to be perfect; it is, in fact, placed there as a living model of its kind: hence no sickly and unprosperous plants ought to be retained. This is a great measure to be realized by cultivating a *larger proportion of such trees as are adapted to the soil*: thus, on barren sandy land the coniferæ succeed to perfection, but much less satisfactorily on cold clayey soil: oaks, again, a numerous and beautiful family group, succeed best in deep free loamy soil, and so on with other kinds. Again, if the situation be mountainous or flat, these features afford another basis for a selection of kinds.

The ground should of course be well

drained, and should also contain a piece of water, near to which the willows, alders, and other sub-aquatic trees should be planted. The general preparation of the ground should be conducted as in the case of forming lawns and shrubberies. At the time of planting the trees, for all except the commoner sorts, a cubic yard or two of prepared soil suitable to each plant should be placed immediately around its roots; this gives it a good start. Where there are several plants of the same nature to be planted in a group, the whole clump should be prepared in this way; thus, in the case of a bed of Rhododendrons and Azaleas, the soil within the area of the bed should be more or less intermixed with peat earth. In this special way, for all the choicer plants, should the soil into which they are immediately planted be prepared for their reception. Where the plant is not of large growth a cubic yard of soil would provide space enough for its roots, at least till it had assumed a mature aspect; but in the case of larger growing trees, where they are rare, and choice enough to be worth the trouble, a larger amount of prepared soil may be provided for them. In planting, the base of the stem—the point whence the roots and stem separate in different directions—should be quite even with, or in most cases above the ordinary level of the ground: when planted the tree should *appear* as though a little mound had been raised around the stem, but this must by no means be actually the case; the appearance should result from keeping the base of the tree elevated, and the soil being raised in such a manner as to just cover the roots. Generally speaking, shrubs should be less elevated in planting than trees; but no general rule can in this respect be given; except that in dry soils the elevation must be less than in moist situations, because in the latter the roots are more liable to suffer from an excess of water: in dry soils, on the other hand, the trees are sometimes liable to suffer from drought when too much elevated. When specimen trees and shrubs are introduced on the lawn, or in the prominent parts of the shrubbery, the preparation of the soil for the choicer kinds should be attended to as already noticed.

An enumeration of all Arboretum plants would be impracticable, from the great variety which exists; but the following condensed view of the hardy kinds, in family groups, may be useful:—

Abies (Spruce fir); several species and varieties; evergreen lofty trees and shrubs, with needle-shaped leaves.

Acer (Maple); many species and varieties; deciduous trees of various size, with leaves mostly large and lobed.

Adenocarpus; few species; sub-evergreen straggling shrubs, with yellow flowers.

Esculus (Horse Chestnut); few species; deciduous trees, with large palmately divided leaves and gay flowers.

Ailantus; one species; a deciduous tree, with large handsome pinnate leaves.

Alnus (Alder); several species; deciduous trees and shrubs with leaves mostly of oblong outline.

Amelanchier; few species; deciduous small trees with white flowers; early.

Amorpha; few species; deciduous shrubs, with handsome compound leaves, and purple flowers.

Ampelopsis; two species; deciduous climbing shrubs, with palmate or pinnate leaves.

Amygdalus (Almond); few species; deciduous shrubs, or small trees, with pink blossoms; early.

Andromeda; few species; evergreen undershrubs, with pinkish flowers; requires peat earth.

Androsæmum (Tutsan); one species; sub-evergreen undershrub, with large yellow flowers; grows under the drip of trees.

Araucaria; one species; evergreen tree, with stiff imbricated lance-shaped leaves.

Arbutus (Strawberry tree); several species; evergreen shrubs, with whitish flowers and showy fruit.

Aristolochia; few species; deciduous climbers, with large heart shaped leaves.

Aucuba; one species and variety; evergreen shrubs, with handsome blotched leaves.

Azalea; several species and many varieties; deciduous shrubs, with gay flowers of various colours; peat earth.

Berberis (Berberry); many species; evergreen or deciduous shrubs, with yellow flowers and showy fruit; one group has fine pinnated leaves.

Betula (Birch); several species and varieties; deciduous trees, mostly of light elegant habit.

Broussonetia; one species and some varieties; deciduous low trees, with singularly lobed leaves.

Buddlea; one species; sub-evergreen shrub, with globular heads of honey-scented orange coloured flowers.

Buxus (Box); few species and several varieties; evergreen shrubs of neat habit, several varieties have variegated leaves.

Calluna (Heather); one species and several varieties; small evergreen undershrubs, varying in the colour of the flowers; peat earth.

Calophaca; one species; deciduous shrub, with pinnate leaves and yellow flowers.

Caragana; few species; deciduous shrubs and small trees, with pinnate leaves, and mostly yellow flowers.

Carpinus (Hornbeam); few species; deciduous trees, with moderate sized ovate leaves.

Carya (Hickory tree); several species; deciduous trees, with large pinnated leaves, and fruit something like walnuts.

Cassandra; few species and varieties; evergreen undershrubs with white flowers; peat earth.

Castanea (Chestnut); few species and varieties; deciduous trees with large foliage and edible fruit.

Catalpa; one species; deciduous tree, with large heart-shaped leaves, and handsome white flowers.

Cedrus (Cedar); two species; evergreen trees, with needle-shaped leaves in little tufts.

Cerasus (Cherry); many species; trees and shrubs, mostly deciduous, some evergreen, with white flowers.

Cercis (Judas tree); two species and some varieties; deciduous trees, with roundish leaves and pink flowers.

Chimonanthus (Winter flower); one species and several varieties; deciduous shrubs with yellowish flowers, very fragrant, produced in winter.

Chionanthus (Fringe tree); one species and some varieties; deciduous large shrub with white flowers.

Cistus (Rock rose); many species; sub-evergreen shrubs or undershrubs, with showy flowers varying in colour.

Clematis (Virgin's bower); many species; deciduous climbing shrubs, mostly with whitish or purple flowers.

Clethra; few species; deciduous shrubs with white flowers.

Coleutea (Bladder senna); few species; deciduous shrubs, with pinnate leaves, and flowers usually yellow, succeeded by bladdery legumes.

Comptonia; one species; dwarf deciduous shrub, with elegant fern-like leaves.

Cornus (Dogwood); several species; deciduous shrubs or small trees, mostly with ovate leaves.

Cotoneaster; several species; low trees or shrubs, deciduous or evergreen; the latter are pretty small-leaved dense growing trailing plants.

Cratægus (Thorn); many species; small trees, mostly deciduous, flowering very freely early in spring.

Cupressus (Cypress); several species; evergreen shrubs and trees, with small imbricated leaves.

Cydonia (Quince tree); few species; deciduous trees or shrubs, some bearing very showy flowers.

Cytisus; many species; trees or shrubs, deciduous or sub-evergreen; the flowers mostly yellow, some white.

Dabæcia; one species; evergreen under-

shrub; with purple or white flowers; peat earth.

Daphne; several species; small evergreen or deciduous shrubs, mostly with purplish rosy coloured flowers.

Deutzia; few species; small deciduous shrubs, with pretty white flowers.

Eleagnus (Wild olive); few species; deciduous shrubs or small trees with silvery leaves.

Epigæa; one species; small creeping evergreen shrub, with beautiful pinkish flowers; peat earth.

Erica (Heath); few species; evergreen low shrubs, with needle-shaped leaves and gay flowers; peat earth.

Escallonia; few species; sub-evergreen shrubs, suitable for rockwork or walls.

Euonymus (Spindle tree); several species; deciduous or evergreen shrubs and low trees, in some instances trailing.

Fagus (Beech); several species; deciduous trees, sometimes evergreen; of the common beech, there are some varieties with handsome coloured leaves, as the purple and the copper coloured.

Frazinus (Ash); several species; deciduous trees, with large pinnated leaves.

Garrya; few species; handsome evergreen shrubs, with flowers in long catkins; blooming in winter.

Gaultheria; few species; small evergreen shrubs, with white or rose coloured flowers; peat earth.

Genista; many species; deciduous and evergreen shrubs, some trailing, mostly with yellow flowers.

Gleditschia; several species; deciduous small trees with pinnate, or bipinnate, leaves, and strong rigid spines.

Gordonia; two species; sub-evergreen or deciduous shrubs with large white flowers, like single Camellias.

Gymnocladus; one species; deciduous tree, with large bipinnate leaves, sometimes three feet long on young trees.

Gypsocalis (Moor heath); few species; small evergreen shrubs, with needle-shaped leaves and pretty flowers; peat earth.

Halimodendron (Salt tree); one species; deciduous shrub, with fragrant pink flowers; forms a beautiful drooping tree, when grafted standard high.

Halesia (Snowdrop tree); few species; deciduous small trees, with white flowers.

Hedera (Ivy); one species and several varieties; evergreen trailing shrubs, well known; some of the varieties are curious.

Helianthemum (Sun rose); several species; small prostrate evergreen sub-shrubs, with showy flowers; suitable for dry rocky places.

Hibiscus; one species and several varieties; deciduous shrubs, with very handsome flowers.

Hydrangea; few species; deciduous shrubs, with large heads of flowers.

Hypericum (St. John's Wort); few species; sub-evergreen, or deciduous shrubs, with yellow flowers.

Ilex (Holly); several species and varieties; evergreen shrubs with fine (mostly prickly) foliage; some of the variegated varieties are very handsome.

Itæa; one species; deciduous shrub with white flowers, blooming late.

Jasminum (Jasmine); few species; sub-evergreen twining or rambling shrubs, with yellow or white fragrant flowers.

Juglans (Walnut tree); few species; deciduous trees with large pinnated leaves.

Juniperus (Juniper); several species; evergreen shrubs, with narrow rigid leaves.

Kalmia; few species; evergreen under-shrubs, with pink or white flowers; requires peat earth.

Köbreuteria; one species; deciduous small tree, with handsome pinnated leaves and yellow flowers.

Larix (Larch); few species; deciduous trees, with needle-shaped leaves in little bundles.

Laurus (Laurel* or Bay tree); few species; evergreen or deciduous small trees or shrubs, with large handsome oblong foliage.

Ledum; few species; evergreen low shrubs, with bunches of white flowers; requires peat earth.

Leiophyllum; few species; evergreen low shrubs, with white flowers in bunches; requires peat earth.

Leucothoë; few species; evergreen shrubs, with branching spikes of white flowers; peat earth.

Leycesteria; one species; sub-evergreen shrub, with handsome foliage and whitish flowers.

Ligustrum (Privet); few species and some varieties; sub-evergreen shrubs, with handsome foliage and white flowers.

Liquidambar; few species; deciduous trees, with pretty palmately lobed leaves.

Liriodendron (Tulip tree); one species; deciduous tree, with curiously lobed leaves, and whitish tulip-like flowers.

Lonicera (Honeysuckle); many species; deciduous or evergreen shrubs, of erect or twining habit; several are deliciously scented.

Lycium (Box thorn); few species; deciduous scandent shrubs, often spinous.

Lyonia; several species; evergreen or deciduous shrubs, with white flowers; peat earth.

Magnolia; several species and varieties; evergreen or deciduous shrubs or small trees,

* Not the plant commonly called laurel, which is a *Cerasus*.

with large oblong or oval leaves, and handsome odorous flowers.

Menziesia; two species; deciduous low shrubs, requiring peat earth.

Mespilus (Medlar); two species; deciduous trees, with large simple foliage.

Morus (Mulberry); few species and several varieties; deciduous trees, with large foliage, mostly heart-shaped.

Myrica (Candle-berry Myrtle); few species; deciduous or evergreen shrubs, with lance-shaped leaves.

Negundo (Box Elder); one species and some varieties; deciduous small trees, with pinnate leaves.

Nyssa (Tupelo tree); few species; deciduous trees, with ovate or oblong leaves.

Ornus (Flowering Ash); few species; deciduous trees, with handsome pinnated foliage.

Ostrya (Hop Hornbeam); two species; deciduous trees, with ovate leaves; resembles hornbeam.

Oxycoccus (Cranberry); few species; small sub-evergreen shrubs, with large red fruit.

Pavia; few species; deciduous trees, with palmate foliage, and pretty flowers; allied to the horse-chestnut.

Periploca; two species; deciduous twining shrubs, useful for covering walls or arbours.

Pernettya; few species; small evergreen shrubs, with small rigid leaves and white flowers; peat earth.

Persica (Peach tree); one species, and some varieties; deciduous small trees, with pink flowers; the double-flowered peach is very ornamental.

Philadelphus (Mock Orange); several species; deciduous shrubs, with pretty white flowers.

Phillyrea; several species and varieties; evergreen shrubs of neat habit, with oval leaves.

Picea (Silver Fir); many species; evergreen lofty trees, with small linear leaves.

Pinus (Pine tree); many species; evergreen trees and shrubs, with needle-shaped leaves in bundles.

Pistacia; few species; deciduous or evergreen small trees, with pinnate leaves.

Platanus (Plane tree); two species and some varieties; deciduous trees, with large palmate leaves.

Populus (Poplar); several species; deciduous trees, mostly with ample foliage, usually of a heart-shaped figure.

Prinos (Winter berry); few species; deciduous or evergreen shrubs, mostly producing conspicuous berries.

Prunus (Plum tree); several species; deciduous trees and shrubs, bearing white flowers.

Ptelea; one species and some varieties; deciduous low tree, with trifoliate leaves.

Pyrus (Pear tree); many species; deciduous or sub-evergreen low trees or shrubs.

Quercus (Oak); many species; deciduous and evergreen trees and shrubs, presenting great variety in the foliage, both as regards size, form, and duration.

Rhamnus (Buckthorn); many species; evergreen or deciduous trees or shrubs, with differently formed leaves, mostly somewhat ovate.

Rhododendron (Rose Bay); many species and numerous varieties; evergreen shrubs, with very beautiful flowers growing in bunches.

Rhus (Sumach); several species; deciduous shrubs or small trees, mostly with pinnated leaves. *R. Cotinus* has roundish leaves, and bears tufts of singular feathery hair-like pedicels.

Ribes; many species; deciduous shrubs, with lobed leaves, and various coloured flowers, many kinds blooming very early in spring.

Robinia (Locust tree); few species, and some varieties; deciduous trees, with elegant pinnated foliage; the Rose Acacia (*R. hispida*) is a beautiful small tree, with rose-coloured flowers.

Rosa (Rose); many species and numerous botanical varieties, besides florists' hybrids.

Rubus (Bramble); many species; deciduous shrubs, with prickly stems, mostly trailing.

Ruscus (Butcher's broom); few species; low evergreen shrubs.

Salisburia; one species; deciduous tree, with curiously wedge-shaped lobed leaves.

Salix (Willow); many species; deciduous trees or shrubs, with lance-shaped, or roundish leaves.

Sambucus (Elder); few species and some varieties; deciduous trees, with pinnate leaves; some of the varieties are interesting.

Smilax; several species; mostly evergreen rambling shrubs, with straight-veined, distinct-looking foliage.

Sophora; two species; deciduous small trees, with pinnated leaves.

Spartium (Spanish broom); one species and some varieties; shrub with evergreen branches and yellow flowers.

Spiræa; several species; deciduous shrubs of neat habit, with pretty flowers.

Symphoricarpos (St. Peter's Wort); few species; deciduous shrubs of very neat habit, one which bears white berries is called the Snow-berry.

Syringa (Lilac); few species and some varieties; deciduous trees, with very beautiful blossoms, well known.

Taxus (Yew); few species; evergreen shrub, with linear leaves of a deep green.

Taxodium (Deciduous Cypress); one species and some varieties; deciduous trees with linear leaves of a very light green.

Tecoma; two species; deciduous climbing shrubs, with pinnate leaves and trumpet-shaped blossoms.

Thuja (Arbor-vitæ); several species; evergreen shrubs, with small scale-like imbricated leaves.

Tilia (Lime); several species and varieties; deciduous trees, with cordate leaves; the flowers are very sweet.

Torreya; one species; evergreen tree, with linear, yew-like leaves.

Ulex (Furze); two species and some varieties; evergreen shrubs, with rigid spines for leaves; the double-flowered Furze is a beautiful plant.

Ulmus (Elm); several species and many varieties; deciduous trees, mostly with roundish leaves.

Vaccinium (Whortle-berry); several species; deciduous or evergreen shrubs, many bearing edible fruit.

Viburnum; several species; deciduous or evergreen trees or shrubs, with very conspicuous bunches of white flowers; this includes the Laurustinus, and Guelder Rose.

Vinca (Periwinkle); few species and some varieties; evergreen prostrate under-shrubs, growing well beneath larger trees.

Viscum (Mistletoe); one species; evergreen parasitical shrub, with white berries. This interesting and singular plant is easily cultivated.

Vitex (Chaste tree); few species; deciduous shrubs, with digitate leaves.

Vitis (Grape Vine); few species; deciduous climbing shrubs, mostly with large lobed leaves.

Wistaria; two species; deciduous climbing shrubs, with pinnate leaves and long drooping clusters of bluish-lilac flowers.

Xanthoxylum (Tooth-ache tree); two species; deciduous low trees, with pinnate leaves.

Yucca (Adam's Needle); several species; evergreen shrubs, with a tuft of sword-shaped leaves; palm-like in habit; the flowers are whitish and handsome.

Zenobia; one species and some varieties; low deciduous shrubs, with white flowers; peat earth.

Zizyphus (Jujube); one species; deciduous tree, with ovate leaves, and red fruit.

In most cases young plants are preferable to older ones, especially if these have not been very frequently transplanted. This is particularly the case with plants that form tap roots, such as the oaks, and others, as the pines and firs, whose fibrous roots do not

abound. Trees and shrubs of this nature should be planted out permanently when not more than two years old, having been previously transplanted at the age of one year. There are some kinds, on the other hand, which produce fibrous roots in such dense masses that they may be moved at almost any age with success, and that even without preparatory transplantations; the common lilæ is an instance of this, and most of the American shrubs whose roots form dense hair-like masses, may be similarly treated. Those trees and shrubs which do not readily transplant are often kept in pots in order to facilitate their removal, but the practice has nothing but necessity to recommend it. Where the plants are required to grow freely and attain ultimate perfection, all that have been confined in pots for a longer period than two years—or one year, unless the pots are larger than what are usually employed—should be rejected. Plants that have been kept in pots should never be planted out without having the roots uncoiled; and they must then be laid out in a radiating form diverging on every side of the stem. This uncoiling of the roots, though it may tend in some degree to check the plants for a time, is yet the means of fixing them more firmly in the soil, and securing their ultimate prosperity. If this is not done, they are apt to dwindle in their growth, and are exceedingly liable to be blown aside by strong winds.

In making the selection of plants according to the number which the space will admit of being planted, a due proportion of the different genera should be chosen, in order to secure as great variety as possible, at least as much variety as can be attained among such kinds as are adapted to the soil and situation.

ORNAMENTAL WATER.

WHEN well designed, and in appropriate situations, the effect of water in pleasure-ground scenery is very striking and beautiful. This adaptation of its form and situation, however, belongs to the landscape gardener.

The first practical operation involved in forming a piece of water, after it has been designed, is to indicate, by means of small pegs, the form it is designed to assume. Then follows the excavation of the main body of the soil, which should be taken out three feet wider all round than it is intended the water should extend. An average depth of four feet of water is abundantly sufficient, but at least a foot below this must consist of prepared clay, laid in the bottom to retain the water. The sides should slope gradually inwards, when finished; and in order that the prepared clay, which it is necessary to place against the sides, may not slip and become ineffective in retaining

the water, this part should, in the rough excavation, be left in steps, which may project inwards at the base as much as three feet in the depth of four feet, gradually lessening in width to the top.

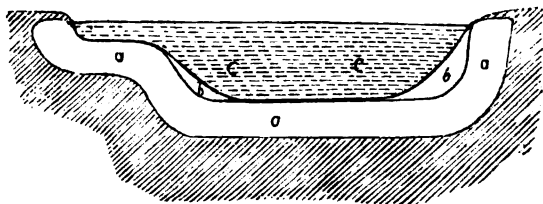
In gravelly soils there is much difficulty in forming a piece of water, as the whole of the bottom and sides requires a coating two feet in thickness, at the least, of tempered clay, technically called "puddle," in order to retain the water. In clayey soils the same kind of coating is necessary; but in this latter case the difficulty and expense is much less, owing to the presence of the material required for the purpose, which in the case of gravelly soils would have to be procured, and probably brought from a distance. Inexperienced persons are apt to think that clayey soil does not require any preparation to cause it to hold water; but this idea is erroneous: no soils are thoroughly retentive until they have been coated over with prepared clay; this arises from their not being thoroughly free from cracks and fissures, through which the water filtrates, either rapidly or slowly, according to their extent.

When the soil is excavated to the proper width and depth, the puddle must be mixed up and placed as it is required. This puddle is prepared by mixing clay with stiff mortar; this may be done in the place where it is to be used, and it will not then require removal. The puddle placed against the sides is prepared in the same way, and is packed up carefully to the thickness of two feet or more at the bottom, lessening somewhat towards the top. The whole requires to be well worked with wooden beaters. Great care should be taken to work the clay up thoroughly where the bottom puddle and the side puddle meet; if this is not done it is probable that the water may soak away between them. In gravelly soil nearly one-half more in the thickness of the puddle should be allowed. In clayey soils the puddling is usually done as the excavation proceeds, and thus the clay required to form the side puddle is worked up at once with less

labour of removal than if the whole excavation were completed before the puddling was commenced: the latter operation, however, must not be too long in hand, as the clay would then get too dry, and crack, before the water was let in to preserve it. To prevent this, an inch or two of water should stand in the bottom, and the sides should be examined, and where any disposition to crack is evinced, the clay must be well mixed together again, with the beaters. Even after the whole is completed it is desirable to let it stand a few days for the clay to harden, during which time every symptom of a crack or fissure in the puddle must be well worked out. The water may then be let on, and should always be kept up to a certain height; for when the depth of water is allowed to fluctuate, the puddle which becomes exposed will be liable to crack, and then the lake can never be kept full without being repuddled, which is both a difficult and expensive operation. Previous to the water being let on, the top of the side puddle, and for some distance down the sides, should get a coating of six inches of gravel, which very much preserves the puddle, especially in those parts where it is liable to be alternately exposed and covered.

Where any additional effect is gained by increasing the area of the surface of the water, this is easily done by extending the facing or side puddle nearly flat for a foot or more in width all round, the soil being removed low enough to bring the surface of the puddle three or four inches below the usual water-level. A foot or something more gained in this way all round adds considerably to the extent of the water, at a small expenditure of labour; and wherever aquatic plants are introduced, this nearly flat portion is rather convenient than otherwise for fixing the plants, or at least such of them as are planted near the margin.

In addition to the ordinary thickness of puddle placed against the sides, the lower parts of the sides especially should get a foot in thickness of what is called "facing," which is intended to preserve the puddle in its place.



This facing may also consist of tempered clay, and should be placed down at the time the puddle is formed, and covered with the gravel which has already been directed to be laid on

the surface. The position of these parts will be understood more clearly by a reference to the accompanying section of a piece of water, where they are all indicated: *a* represents

the puddle, extending along the bottom and up the sides, quite to the surface of the ground; *b* is the facing laid against the side-puddle, to keep it in its place, and which is placed there as the work proceeds; *c* represents the water.

Scarcely any feature in a pleasure-ground is more unsatisfactory than a lake or pond, when the supply of water is not sufficient to keep it properly filled. This should receive proper consideration at the time of formation, because sometimes the situation may be selected with a special view to securing a supply of water. When the lake occupies the lowest point of the estate or demesne, or at least when it occupies a low position with regard to the parts adjoining, the drainage of the upper parts very much facilitates the keeping up a supply. This will be the case wherever there is any material degree of fall in the surface; but in very flat situations little reliance can be placed on supplies from this source. The best and most constant supply is that furnished by a running stream; and in this case the lake should be an amplification or widening of the stream, at the point where it is required. Where such natural facilities or auxiliaries do not exist, a supply must be artificially secured; for, as already remarked, nothing is less satisfactory than to see such places half empty in summer. The casual supply derived from rains during winter is never sufficient to keep the basin properly full in the summer season, when evaporation is going on briskly; and in dry summers, ponds which rely solely on this source present a miserably deficient appearance.

The margin of a piece of ornamental water admits of some variety by which it may be adapted, in some measure, to particular scenes. Thus, it may be formed quite smooth and level, with turf, kept closely mown down to the edge; and this is suitable where it joins a highly-kept lawn. On the other hand, it may be perfectly uneven and irregular, not only as regards the herbage growing on the bank, but also as regards the surface of the bank itself; in some situations and portions it may even be allowed to assume a rocky character; these aspects are better suited to wild and romantic scenery. Again, various modifications of these two styles, or combinations of them, may be made to suit particular scenes and situations.

Much of the effect of ornamental water depends on the mode of introducing aquatic plants. Such plants as the Water-lilies (*Nymphæa* and *Nuphar*) must occupy the broad expansive portions of the surface, where their ample leaves and silvery or golden cups may calmly repose on the bosom of the waters. Plants of upright habit should be grouped together in patches, near the margin, their

distribution being governed by the same principles which regulate the arrangement of trees and shrubs on the lawns: such groups should, indeed, have manifest connexion with the adjacent trees. The great Water Dock (*Rumex hydrolapathum*) is a very effective plant, its large, broad, lance-shaped leaves reflected in the water, when accompanied by the narrow, sword-shaped leaves of the Flag Iris (*Iris pseud-acorus*), the Flowering Rush (*Butomus umbellatus*), and the Reed Mace (*Typha*), has a very striking effect. These groups must be introduced here and there, and not at regular distances. Willows, and other drooping trees, may be sparingly planted on the banks; and in some parts plantations of trees and shrubs may completely conceal the boundary of the water.

FORMATION OF ROCK GARDENS.

By a Rock garden is understood a detached spot, whose leading features consist of aggregations of rude stone-work, usually in imitation (though in too many cases but a very sorry one) of natural rocks. These rude masses of stone, or of material in imitation of stone, are interspersed with such plants and shrubs as are found to thrive in such situations, and to accord in character with the surrounding scene.

In the construction and arrangement of rock gardens, there is much scope for taste; and there are some general principles which can hardly be violated with impunity. In the first place, such gardens should (generally) be isolated; besides this, they ought not to betray the hand of art; and further, they hardly admit of being rendered effective on a very limited scale, and therefore should not be attempted by those who have not the means or inclination to carry them out consistently as a whole. When isolated, which should always be the case in any other than a rocky district, one character of rock should predominate to the exclusion of all such as may be geologically inconsistent with it; and when not isolated, which should only happen when surrounding features are accordant, the character of the rock-work must be that which is natural to the scene.

To point out the grounds upon which these principles are based, would lead us beyond our limits into the "realms of taste," but a few explanatory remarks may be proper. It is obvious that a rock garden should be isolated from surrounding scenery, except in the cases alluded to, on account of its being directly of an opposite character from that which is predominant in every other part of a garden or pleasure ground; hence it would appear incongruous if mixed up with other parts. Nature teaches us to keep such scenes

distinct: we may indeed meet with smooth glades amidst natural rocky scenery, but they are subordinate; and we do not find subordinate rocky scenery (as a patch of rock-work in a pleasure ground would be) associated with nature's smoothness, or incongruously exhibited in her polished scenes. Again, the hand of art should not be apparent, simply because a rock garden is avowedly a representation of nature in her grander moods, and the puny interruptions of art certainly detract from her majestic simplicity. A very common infringement of this principle consists in the introduction of a regular flight of steps among the rugged asperities of the surrounding rock-work, the bad taste displayed in which is, on reflection, obvious enough. Inasmuch as rock-work on a small scale is the most unsatisfactory of garden appendages, there being, in fact, no proper place for it, unless in a scene of its own creating, it will be perceived that it involves much labour and cost, as well as taste, in its formation; and therefore it is that the formation of rock gardens cannot be recommended to those who are not prepared to meet the difficulties and cost which inseparably attach to them. The heavy cost of rock-work when properly formed is explained by the fact, that to produce anything like a grand effect, stupendous materials must be employed: the effect of using small fragments is extremely puerile in comparison with that of blocks of large size. Even when artificial materials are employed, the proper representation of magnitude in the parts is expensive, though to attempt less than this is almost to ensure a failure.

No rock garden should be attempted or prosecuted without a regularly defined plan; and this is especially necessary if large blocks of stone are employed, because, as much mechanical skill and labour is involved in their removal and disposition, they ought to be at once placed where they are required to remain, and this can hardly be done effectively unless their position is previously indicated on a plan. What is even better than a plan is a small model of plaster-of-paris, formed by a skilful workman, because in this, making proper allowance for size, the entire effect is at once perceived.

What the form of a rock garden should be is not easily defined, for, as in the case of pleasure grounds, or flower gardens, the details may be varied in a thousand different ways. It should, however, be complete in itself, consistent in all its parts, and evincing unity of purpose and design; and so that these conditions are complied with, the exact form of the parts may be made to suit particular situations, and to accord with par-

ticular tastes. Nothing could be more appropriate than to select some natural isolated romantic spot,—and such spots are numerous enough if they are sought,—and to make this the model of the artificial rockwork. If in this way nature is followed with integrity, there will be little danger of committing those incongruous errors which have already been alluded to.

The formation of the rock-work consists simply in placing the materials employed, whether it be blocks of stone, or vitrified brick, or whatever it may be, in the position determined on the plan; these materials are supported behind and beneath with embankments of soil, and it is part of the business of construction to take care that the upper parts are sufficiently borne up by the lower ones, else, though they may stand for a time, they will probably fall after a soaking of rain has caused a subsidence of the soil, and thus the labour will have been expended in vain. If blocks of natural stone are employed, they should, if possible, be placed in layers according with the natural stratification of the particular kind of rock; and where artificial materials, such as vitrified bricks, or scoriæ coated with cement, are employed, they are generally coloured, and also formed so as to represent this kind of stratification. The interstices between the blocks representing natural crevices are the situations where the plants are to be placed. It is by no means essential that the whole area of a rock-garden should present a rocky surface; portions of rock may here and there jut out from the surface of the ground, as though in these parts the soil had been washed away from the underlying rock, whilst other portions, though presenting the rudeness and ruggedness of nature, may consist of soil occupied more or less densely by herbage and plants appropriate to the scene. In this way much greater variety of appearance will be secured than if the whole surface is covered with rock.

If stone is employed in the construction, little more is required beyond placing the blocks in the required position by mechanical power guided by human agency, the soil being well backed up between, behind, and beneath them, as the work proceeds. Where stone is not used, the best substitute is the vitrified brick, always formed where bricks are burnt in clamps. This material, which forms conglomerated masses of irregular shape and variable in size, is fitted and built up by the aid of cement, so as to give nearly the required form; it is then entirely covered by a coating or two of cement, thrown on in a rough way, so as to produce the required degree of ruggedness: the details of form are thus wrought out, and then the whole mass is coloured, so as to give it a time-worn appearance. Dull colours,

of a brownish or greenish tint, should generally be used; though if any particular kind of rock is intended to be represented, its natural colours should be indicated. Stratification is also indicated by colouring.

Rock gardens being intended to be furnished with plants, provision should be made for them by forming hollow recesses and protuberances, in, on, or against which the plants may be fixed. Larger plants, such as the shrubs which may be employed, should be fixed in the natural or artificial crevices and fissures, where they will appear in a natural condition. Smaller plants, such as Alpines, ferns, &c. may be fixed to the little hollows and protuberances alluded to, but in doing this, their natural habits must be discriminated; such as the ferns, which require shade, being placed in shady situations, whilst those which require exposure, as many of the Alpines and shrubs, occupy the more prominent positions. The soil provided for these plants should be mostly of a light loamy character, this suiting the generality of them. Some of the more delicate ferns, however, grow better with an admixture of peat earth. The north or shady parts, being most suitable for ferns, should have the parts intended for these plants provided with a mixture of equal parts peat soil, leaf mould, and sandy loam; and the parts intended for ordinary Alpines should have a less proportion of peat earth. On the sunny side, provision should be made for such plants as the *Helianthemums* and *Cistuses*; a mixture of sandy loam and peat earth, with a good proportion of white sand added, should be placed in the crevices and recesses for these plants. On the most exposed parts a very sandy soil should be placed, mixed with a portion of loam and peat, which will suit such plants as *Saxifrages*. Where any of the *Ericas*, *Arbutuses*, *Gaultherias*, and similar plants are introduced, sandy peat earth should be provided for them; while all the larger ferns and common shrubs and other plants will grow well enough in the common soil.

There is one point which nature provides for by innumerable small crevices, that requires to be attended to in forming artificial rock-work, and that is, to take care that the ledges, hollows, and recesses formed to receive the soil and the plants, are provided at the bottom with some outlet for superfluous water; if this is not done, and the superfluous water is suffered to lodge and accumulate, the destruction in winter of many delicate plants is certain. This provision for drainage is easily made, by piercing a few holes through the coating of cement at the time these parts are formed.

The plants selected for rock gardens should

be so entirely hardy as not to require any protection, and little care and attention, after being once properly planted. It will, however, be desirable to ascertain from time to time that none of the choicer kinds are suffering from accumulated moisture; if this is found to be the case, the remedy is simple, namely, to form an outlet for it. It is also necessary to see that the stronger growing and especially trailing plants are not spreading over and thereby injuring the smaller and delicate kinds; this is very frequently found to be the case, unless the former are from time to time properly pruned back. In cases, however, where, for the sake of effect, it is desirable to allow the larger plant to extend itself unpruned, the smaller one should be removed to a more suitable situation; this may especially happen sometimes to be the case with evergreen trailing shrubs, whose enduring and cheerful aspect can hardly be sacrificed with propriety to a less effective subject, however choice and valuable it may be. In such cases, it is at least much better to remove the smaller plants than to suffer them to remain, and mar the general effect, by involving the mutilation of what forms the most conspicuous objects. This we have pointed out rather minutely, because it is, perhaps, one of the commonest and greatest evils in the management of rock gardens. Another point which claims consideration at the time of planting, is to place these spreading plants so far from the others as not to interfere with their growth for some time at least. A little attention to this at planting time would often save much after trouble.

No very clear rule can be given as to the relative position of the different kinds of plants which are introduced, as regards their elevation. Strict accordance with nature would lead us to place the smallest plants on the highest parts, and the larger ones below them, but this would be evidently opposed to the purpose of the rock-garden, which is formed principally for the cultivation and display of the minute but interesting plants which are designated Alpines. Something may be done in carrying out the principle alluded to, by placing the smaller plants near the tops of some of the smaller protuberances of rock near the base, where they would be easy of access; and where the rock-work is on a large scale, a diminution in the size of the shrubby plants near the top will serve to convey an idea of the depressing influence which altitude has on vegetation. On some of the bolder parts (and no piece of rock-work should be formed without having some degree of boldness in its character) some striking and appropriate trees should be planted, which may ultimately aid

in giving the desired romantic effect: such trees must, however, be planted young, and be allowed to mould themselves to the scene. The Highland Pine (*Pinus sylvestris horizontalis*) is a tree suited for such a purpose; so also is the common Birch (*Betula alba*). Of other shrubby plants which have a good effect among rock-work, the Adam's needle (*Yucca*), and the Cypress (*Cupressus*), may be specially mentioned, the spire-like habit of the latter, and the tuft palm-like appearance of the former, giving them a distinctness which contrasts well with other plants; both these, however, should be kept somewhat near the base, placed on some jutting block, and they may be either isolated, or admit of being grouped with plants of other forms.

Such plants, again, as Strawberry trees (*Arbutus*), the Sun rose (*Helianthemum*), the Rock rose (*Cistus*), the Bramble (*Rubus*), and the wild Rose (*Rosa*), are appropriate in rock gardens; but they should, the two latter especially, be suffered to grow with all the rudeness of nature. The wild Honeysuckle (*Lonicera*), and scrubby plants of the Hawthorn (*Crataegus*), both the pink and the white-flowered, with the Furze (*Ulex*), the dwarf, the double, and the Irish, are all suitable plants, and have a good effect. Many of the Coniferæ, especially the Junipers (*Juniperus*), are very suitable; the procumbent varieties being very proper for the higher parts, as are also the procumbent and low-growing species of *Genista*. The Ivy (*Hedera Helix*) must not be forgotten, for both its associations and its effect are highly desirable in such situations. This will convey some idea of the class of shrubby plants which may be introduced, but of course there are many more than those here indicated which may be employed. Of herbaceous perennials the list is so extensive, that we can hardly venture to particularize. We must however state that the Wall-flower (*Cheiranthus Cheiri*), is appropriate, especially against any parts

which are perpendicular, or nearly so; the numerous kinds of *Saxifraga* also are indispensable, and form exceedingly pretty and neat-looking tufts; many species of Bell flower (*Campanula*), and of Pink (*Dianthus*), are specially suitable, and indeed any of the smaller herbaceous plants and all those of trailing habit may be introduced.

Ruins, antiquities, and mineral curiosities, as garden decorations, class with ornamental rock-work. In fact, artificial rock-work may very appropriately represent some interesting ruin, and this will afford good accommodation for mural plants; and in like manner, interesting antiquities and mineral curiosities may be introduced sparingly among rock-work, but such things are easily overdone.

A very effective feature may be produced in a rock garden, by constructing a dark cave or cavernous recess, and planting just within it a strong tuft of the elegant Lady Fern (*Athyrium Felix-femina*); the delicate feathery fronds of this plant, seen in this position, have a charming effect; and various other ferns flourish in such situations.

Root-work is very similar in character to rock-work, being intended to produce a wild and romantic effect in pleasure-ground scenery. In this case, however, instead of blocks of stone, or imitations of them, the materials operated on are rough stumps of trees with the roots attached, forming rude and very irregular masses. These are packed together into the form which is required, and are then to be planted at the base with such plants as Ivy, Clematis, Roses, Honeysuckles, Virginian Creeper, &c., which run over them and form interesting masses. Root-work is, however, rather apt to encourage and harbour such vermin as slugs and snails, and is, perhaps, on this ground objectionable. It presents, however, an easy and ready mode of forming a close and impervious screen, without involving the formality of a hedge or other fence.

NEGLECTED PLANTS.

How strange a confirmation of the truism, "Too much familiarity breeds contempt," may be found in the world of flowers and plants! The most beautiful things in the vegetable kingdom are neglected when they become abundant, and comparatively worthless subjects are courted and esteemed while they are scarce. We may hear a beautiful melody until we are nauseated with it, and we may see flowers and plants so common that we treat them with contempt. But men ought to endeavour to correct this morbid appetite for

novelty, and cure themselves of their ill-founded dislike to subjects that are plentiful. But plants are first doomed to neglect for their abundance, and many have been actually thrown aside. It is with a view to bring some of these subjects from their lowly station or their oblivion, that we have commenced this article, and we hope we shall be able to impress upon the reader the necessity of looking well to the properties of a plant before he adopts a novelty or rejects an old favourite. Some of the subjects we have mentioned in

the following remarks will bear comparison with the most valuable of modern introductions ; and it behoves the lovers of the garden, the owners of an establishment, to insist on their being brought forward conspicuously, for they deserve it more than a vast majority of costly and novel plants that bear a heavy price.

THE AGAPANTHUS.

WE class this splendid subject among neglected plants, because in the few places where it is seen, it is hardly worthy of the name, from the imperfect manner in which its growth and flowers, in nearly all cases, appear. It may be familiar with some of our readers when described as a leeky-looking plant, with an upright stem, and a small mop-like head of blue or whitish flowers. Being unable to sustain itself through our sharp frosts, it is usually grown in pots, but as it is very nearly



hardy, it is too often kept among the plants of secondary importance, in the cold frames or pits. Like all other subjects of which the head of flowers is the leading object, there should never be a second head allowed on the plant, and the offsets should be removed as soon as they are large enough to take off. The usual culture is marked by that kind of inattention that is seen to result in the starvation of the plant, and the consequent smallness of its bloom. They are potted and put among the ordinary miscellaneous contents of a cold frame ; they have to endure all sorts of privations and visitations calculated to hurt plants : the want of water and room to grow in, and the hot beams of the sun to bake up the root, are their lot at one season ; and at another, they are deprived of air and suffer damp. In short, they are fairly classed among neglected plants, and it matters not how soon

they are rescued from the degraded rank they at present hold. We have seen, by the occasional introduction of the plant in flower among the collections at the shows, the state in which modern gardeners think it exhibit-able. To us, who have seen the head of flowers twice as large, and the growth of the plant handsome, the best we have ever seen at exhibitions was a comparative weed. The only way to grow it is as a single plant ; no offsets should be allowed on any condition to grow large enough to rob the parent of any nutrition, for although offsets may have their own roots, and may not receive much nourishment direct from the principal plant, the roots themselves take from the soil that which the main plant requires. The rules may be laid down something after this fashion for the production of the Agapanthus in its best possible state. We might observe, perhaps, that although the several kinds will supply bloom collectively from April till October, Agapanthus umbellatus is our favourite. This and A. variegatus bloom in April and May, præcox in June and July, minor in August and September, and albidus in September and October. All are pretty.

These plants should be separated every year, and the separate plants potted in the size best adapted for the roots, in most cases size 32 ; in some cases, if smaller plants, the size 48 will do to commence. The soil should be the richest loam obtained from rotted turf, three-fourths, one-fourth cow dung and sand, with the impurities of every kind washed out. Choose a plant with a good solid heart and plenty of leaves, place potsherds or crocks about two inches thick in the bottom, and plant the subject so that the collar shall be close up to the surface, that is to say, the root only shall be underneath, for if the heart of the plant is sunk at all, it retards the healthy growth, and blanches the leaves. Let this be done in autumn, and place them in a greenhouse, but where no fire is kept, or in a brick pit that is very dry with a hard bottom, and so contrived that wet shall run off when it runs through the pots ; give air in mild weather by entirely removing the lights, but when the winds are cold or boisterous, or the rain cold, as well as when frosty, keep the lights on and close down, or tilted a little on the side or end opposite the weather. What is required is steady growth without checks.

When the pots are filled with roots let the plants be shifted to those of a larger size, and remove all the side shoots or suckers with a sharp knife, or by pulling off without disturbing the ball of earth any more than can be helped. You want all the growth in one central heart or plant, and nothing to detract from it. They may then be returned to the

frame, and greater care should be taken than ever to prevent a check. Also the suckers must be removed directly they appear, and not be allowed to grow at all. If the shift before is from forty-eights to thirty-twos, they must next be changed to twenty-fours, and from these to sixteens, but the latter shift may not be required till the spring. The rule is to shift them when the roots begin to mat or cross one another next the side of the pot. It may happen that in March or April they throw up their flower stem, and the instant they show this the ball should be examined, to see if the roots reach the side; if they do, give them another shift, whatever size they may be in, and water freely, but never let them be watered when the soil is moist. They are now doubly sensible of a check, and therefore require the more care. They like to be cool, but never cold. If they bloom the first spring after planting, it is never so large as when they go over a second; but with care the bloom of a first spring is twice the size of those we are used to see in plants neglected in the ordinary way, by being thrust with other half-hardy things in a cold frame, sometimes only half glazed, sometimes open in bad weather, and at other times closed in mild. Continue to remove suckers or offsets until the bloom is over. Those plants which do not throw up their flower must be attended to in the same way throughout a second season, and during the summer months must not be subjected to the full influence of the sun all day. They should be placed on a dry bottom, where they will have only the morning and evening sun, and not the full mid-day beams, for it only dries up their roots next the pot, and checks them as fatally as frost would in winter. Nor must they be exposed to heavy rains. The best management through the summer is to keep them in the pots, but to cover them in the middle of the day with the glass, tilted all round, and a slight transparent cloth upon the glass. We are prepared to hear many say, this is taking a great deal of useless trouble, but if they will try a few this way, and let the others remain neglected as usual, with the offsets accumulating in the pots, and the plants sometimes wet and sometimes dry, sometimes burning in the sun, and at other times perished with the frost or cold winds, they will soon admit that they have never seen the *Agapanthus umbellatus* in its true character; for in perfection it is a noble plant.

ORANGE AND LEMON TREES.

There is something aristocratic in the appearance of an orange or lemon tree, and although they require no more pains than many plants which are nursed and taken great care

of, there is nothing much more neglected. In all establishments there are some overgrown, long-legged, pot-bound plants, that exhibit all the symptoms of neglect or positive ill-usage; generally speaking, the mould they are in is sour and clogged together, the roots half rotted, the trunk or stems covered with scale or vermin of other kinds, the leaves small and yellow. If we see younger plants, that have only been in the country a year, it is the same so far as it has been carried; at the proper season they are not potted; they are making stunted growth, or are otherwise neglected. Whether it is that the plant is misunderstood, or they are considered not worth the trouble, not one place in twenty is a proper asylum for these trees; and when they are introduced in fine health, they generally get worse and worse, until they are scarcely worth the trouble of recovering or of throwing away. When the tubs, or pots, or boxes in which they grow are too big to move about, and are crowded altogether into a receptacle hardly big enough for a third of their number, we can feel the difficulty of getting at them to give the proper attention, and contemplate the certainty of their taking harm from the confinement, their want of air, light, and water, or from too much wet, with nothing to either drain it off or blow it off. We care not where anybody goes, all the old establishments are alike, and with few exceptions, where everything is first-rate, it is rare to find either an orange or a lemon tree, or any of the tribe of shaddock, citron, or lemon, in what could be fairly called good health and condition. But for its claims on our skill and industry, where is the subject can beat any of the tribe? Its odoriferous qualities are not excelled by those of any subject in cultivation. Perhaps the *Daphne indica odorata* may take its place by the side of these, but certainly if there be any difference the *Daphne* must give place to the orange and citron tribe. The flowers are delicate and graceful, the tree ever-green and handsome, and tractable in every sense of the word, for it may be trained a dwarf, a pyramid, or a standard. It may be budded, grafted, or struck from cuttings, each will grow in the stock of the other, and the tree, kept in good order, will, during a great part of the year, have flowers, and fruit of all sizes and states of ripeness and unripeness. But no tree sooner feels the effect of neglect, and none have been more subject to it. The shaddock is the most rapid growing of the whole family, and therefore is strongly recommended for stocks, and all the kinds will graft or bud well on it, and grow vigorously. Our first business is to direct something to be done with the old and ugly trees already about the country.

MANAGEMENT OF OLD TREES IN BAD HEALTH.

Cut in the head to half its present size, and cut out altogether some of the weakest branches, that there may be room for a healthy growth from the shortened branches; at the same time that the head is cut in, take the roots out of the tub or pot, and if the ball be very hard, damp, and black, soak it some hours, and wash out all the earth. Fill the pot, box, or tub thus: first put plenty of crocks, to secure good drainage, next the loam from rotted turves three-fourths, one-fourth cow-dung and peat, the cow-dung very much damped into mould, and the peat, which should be turfy, broken small,—the whole well mixed; some of this on top of the turves, to make a bed as it were for the bottom of the roots, and the pot, tub, or box must be filled up with the compost, tucked in between and well shaken. Orange and lemon trees that appear to be doing no good, and growing no form, or an ugly one, with naked branches and weakly shoots, may by this operation be renovated in two or three seasons to full beauty and bearing. But some conditions must be observed in all cases; first, that as the rotten, decayed, and closely matted portions of root must be removed, a large portion of the head must be removed also; second, that the roots must be pressed on all sides with the soil, and this can only be done with great care, and pressing the earth between them with a blunt piece of wood. It is however better in all cases to freely prune the roots, to facilitate this part of the operation, and to cut the head in to a complete skeleton, and shorten the whole of the branches very much, to compensate for the loss of roots, and begin the larger quantity of new wood. Let the trees thus treated be placed in a close house for some time, until the young growth has started, when all the shoots wanted to form a good full head must be left on, but others, where they are too thick, must be rubbed off before they waste the resources of the tree unnecessarily. When they are fairly started, they may have air in mild weather, but should be shaded from the mid-day sun. Watering must not be done often, but effectually when done at all; and the pots or tubs must either be on feet, or propped up with bricks or blocks of wood, to let the air go freely underneath them, and the water that comes through them run away. If there be any portions of the tree so bare of shoots as to spoil the appearance, let in a few buds here and there, of the same kind as the head already worked, for nothing is more unsightly than a decided deficiency in the head or bush, nor is there anything much more easily rectified by means of budding or grafting. This attention bestowed on old trees, that are now so many emblems of idleness in old establishments,

would soon change their aspect; for once in sound wholesome compost instead of the filth once recommended, they would grow vigorously and soon bloom. Choose March for the operation; it is on all accounts the best month. As the general culture of the orange forms the subject of a treatise already written for this work, we shall not enlarge upon the general management now, but we strongly recommend all who possess such specimens as we have mentioned, to kill them or cure them directly.

DAPHNE INDICA ODORATA.

This beautiful and highly odoriferous plant is one of the most neglected subjects in cultivation; a good specimen is as scarce as a Queen Anne's farthing; and he is a lucky man who ever possessed one, if indeed he be not lucky who has ever seen one. Its habit of growth is perhaps the very worst that can be imagined, if it be neglected; and we never saw a large one that was not so. Its general growth is with naked stems, that will not support themselves, with a bunch of short branches towards the end, too thick to grow well; and three out of four of the bunches of flowers on old plants are deformed or cockscomb like, and so crowded that the flowers cannot open. Young plants may, however, be grown better, if properly worked and carefully managed; and when a specimen can be got not too long in the legs, and with half a dozen bunches of bloom, it is not only pretty, but of exquisite fragrance and tolerably lasting. We have tried to bring old plants into shape and decent growth until we are almost tired. There is but one proper remedy, and that is to cut them down; but this will not always answer: sometimes they will not break, and the plant is lost; at other times we have been more successful. We now, when we get hold of an antiquated specimen, with its crooked stems bending in all directions, and its bunches of green at the ends, sink the pot in a pit, lay some of the branches, and inarch others on spurge laurel, and so make it at least answer the purposes of propagation. If it breaks near the bottom, so much the better; because, when we release all the layers and grafts from the old stock, any little growth there is greatly strengthened, and we make the most of it. We have in some instances found them break well after all the branches were cut back to a few inches from their base; and when we saw how they were breaking, we have been able to preserve as many shoots as would make a good bushy plant, and rub off or cut away the rest. In growing them, they must not be excited; the slower they grow the better, so that they do grow. A cold pit is the best protection, because it keeps off rain or admits it, according as it may be

wanted or otherwise, and it can be made to keep off frost without wanting fire heat. The soil for these plants should be loam from rotted turves two-thirds, and one-third equal proportions of cow-dung or horse-dung thoroughly decayed, and turfy peat. These should be chopped and rubbed through a very coarse sieve, that would let a bullet through. In cutting down old plants, or before submitting them to the process of laying or inarching, they should be turned out of their pots, and put into larger ones; but if they are to be cut back at once, they may be root pruned if necessary, and for this purpose a good deal of the ball must be removed, and, as soon as it is changed, the plant, or rather the stool of the plant, should be placed in a house of rather warmer temperature than a common greenhouse, for eight or ten days. There are many good nurseries at which they have not a single specimen of this very excellent plant. They seem to us to do better upon their own bottoms than they do worked; for sometimes we have seen a good many that had gone off among a far less quantity that stood. Whether this has arisen from the stocks not being worked in a proper state, or their not being well established, we have yet to learn: we have had many that have stood for years with care and proper culture. Young plants should be kept cool when they have once fairly started. They cannot be better provided for than in a common garden-frame, with a light over them to take off and put on at pleasure. The branches should be thinned if they come too thick, and they want a little regulating and pruning; but it must not be forgotten that the blooms come at the ends of the branches, and therefore that, although branches may be thinned out, none must be shortened till after they have bloomed. When they have done flowering, they may be trimmed into shape, and left to make their proper growth.

HYBRIDIZING.

THE operation of hybridizing plants consists in fertilizing the stigma of the flower of one plant with the pollen of another, of different though allied characters. The effect of this, when the cross fecundation is actually effected, is to originate a new form, usually possessing properties and characters intermediate between its parents. Such a production is a mule or *hybrid* plant, and is to be regarded as a very different thing from what is understood as a *variety*.

In a practical point of view, this power of producing hybrid plants is one of the most important means which man possesses of modifying the vegetable races, and adapting them to his purposes. To it we owe some,

indeed many, of our most beautiful garden flowers, as well as the most valuable of our fruits and vegetables, many of which have been so far improved—we use this word in a relative sense only—that further amelioration or improvement seems hardly to be expected. Very little has been done in altering the characters and properties of our timber trees by this process, but there appears no reason to suppose that they would not admit of as much being effected as in the other classes of plants. Indeed, there is reason to believe that any property that may be possessed by plants of any class, or to which there is any tendency either inherent or manifest, may be modified to an almost unlimited extent by perseverance and assiduity in hybridizing.

It would not be desirable to enumerate all the changes which have been or may be effected by this process; it will be sufficient to notice a few of the most prominent. Among flowers the most important qualities which can be impressed on the different races are greater hardiness of constitution, precocity or tardiness of flowering, the communication of odour where it is not possessed, increase in the size, alterations in the form of individual flowers, or greater prolificacy, and improved arrangement, as regards their collective production. Modifications and blending of colour, which are also sometimes aimed at, seem to be the most paltry changes (in a general sense) of any that are attempted. These changes affect appearance; but among fruit and vegetables the changes to be effected should be confined more to productiveness and quality than to appearance. Thus the increase of size, together with the improvement or modification of the sensible qualities, are the main objects to be sought, followed by such qualities of general application as greater hardiness, precocity, tardity, or productiveness. In timber trees the production of greater bulk is the first object, and then the rendering of this bulk at least of equal, if not superior, strength, toughness, compactness, or whatever peculiar property individual kinds may be prized for.

It has been thought that a law very similar to that which obtains among animals also regulates the production and fertility of mule plants; and so far as observations have been made and recorded, this seems, as a general rule,* to be near the truth. Thus two distinct species of the same genus of plants will, in many cases, produce an intermediate offspring, perfect as far as regards the exercise of vital functions, but defective as regards the

* Much of what may militate against this opinion may probably be referred to some defect in the present means and mode of constructing and distinguishing different genera.

power of perpetuating itself by a seminal process. Even when in the first generation this sterility is not apparent, it becomes so in the second, and less commonly in the third or in the fourth generation. Such mules may, however, be rendered fertile by the application of the pollen of either parent, the characters of which then become assumed by the offspring; in other words, the hybrid form reverts to that of one of its parents. Plants, however, appear to possess this property of admitting of hybridization far more generally than animals; for while animal mules are comparatively rare, there is scarcely any family of plants that will not admit of being hybridized with due care and attention. It is, however, only between species in which the degree of relationship is somewhat close that this intercourse is effected; and as a rule, those plants which accord most fully in general structure and constitution will most readily admit of artificial union. Species that are very dissimilar appear to have some natural obstacle which prevents mutual fertilization, and this obstacle becomes insurmountable in the case of very different genera. No such thing as the intermixture of roses and black currants, and the consequent production of "black roses," of which we do sometimes hear, can therefore possibly take place. There are some few recorded instances of mules between different genera, but in these cases a certain degree of relationship existed, and the productions were both sickly and short-lived. Thus Gärtner is said to have obtained such hybrids, or *bigeners*, as they are termed, between daturas and henbane and tobacco (all solanaceous plants), and between the poppy and horn poppy (both of the same natural order). Weigman was successful in mixing lentils and vetches (both leguminous). Mr. Knight is recorded to have crossed the almond with the peach (both roseaceous). Kölreuter is recorded to have effected a similar union between different malvaceous plants; and Sageret obtained a cross between the cabbage and horseradish, which are both cruciferous plants. The Dean of Manchester, who has given much attention to the subject, and by far the best account of mule plants which has appeared, regards these and other like statements as erroneous, or at least doubtful, and supports this opinion by the fact that, in this country, where the passion for horticulture is very great, and the muling of plants has been carried to a great extent, there is no undoubted instance of a mule between distinct genera. On the other hand, there are many cases recorded of closely allied species refusing to intermix. Mr. Knight could not succeed in effecting a cross between the common and Morello cherries; and Dr. Lindley mentions

his own vain endeavours to cross the gooseberry and the currant. Such plants as the apple and the pear, the raspberry and the blackberry, though very closely related, have not been known to intermix.

Wild hybrid varieties occur but seldom; at least, there are not many well-attested instances of their occurrence. Bentham ascertained that Lapeyrouse's *Saxifraga luteo-purpurea*, and Decandolle's *S. ambigua*, are only wild accidental hybrids between *S. arenaria* and *calyciflora*, being only found where the two latter grow together, and there forming a suite of intermediate states between the two. Such genera as *Salix*, *Rosa*, *Rubus*, &c. are probably composed in a great measure of wild hybrids. Gentians have been remarked on European mountains, which have had such an origin. Bentham also mentions *Cistus longifolius* as being a hybrid between *C. monspessulanus* and *populifolius*, in the woods of Fontfroide, near Narbonne; and *Cistus Ledon* is constantly being produced between *C. monspessulanus* and *laurifolius*. It is the tendency of hybrid plants, when they produce seeds, to revert to their parent forms, that renders wild hybrids so rarely met with. Herbert, however, mentions the following genera as having produced spontaneous hybrids:—*Ranunculus*, *Anemone*, *Hypericum*, *Scleranthus*, *Drosera*, *Potentilla*, *Geum*, *Medicago*, *Galium*, *Centaurea*, *Stachys*, *Rhinanthus*, *Digitalis*, *Verbascum*, *Gentiana*, *Mentha*, *Quercus*, *Salix*, *Narcissus*, and *Crinum*. These names appear to be quoted by Herbert on the authority of Schiede.

Hybrids obtained by fertilizing the pistil of one species by the pollen of another species are considered as true mules or hybrids; the result of intermixing two varieties of the same species is called a *crossbred*. It was held that the former were sterile, and incapable of yielding seed; whilst the others, on the contrary, usually produced fertile seed, which shortly reverted to one or other of the parents, unless again influenced by further hybridization. This opinion, however, that all vegetable hybrids are sterile, is not found to be tenable, though it is the case to a certain extent. The cause of this sterility is very doubtful; it has been referred to a want of pollen, but this explanation is unsatisfactory, inasmuch as no appreciable difference of structure in this respect has been detected in those cases which have been made the subject of especial inquiry. Crossbred varieties may certainly be hybridized, but there is in them a strong tendency to revert to one of the parents. The progeny of varieties of the same species is in all cases as fertile as the parents.

Referring to the botanical questions which the hybridizing of plants involves, and rely-

ing on numerous well-ascertained facts in support of his views, Dr. Herbert considers that genera are the only really natural divisions among plants, the species and varieties of which have all sprung originally from one type; and that, therefore, there is no difference except in degree—that is, no absolute difference between what are called species and varieties. He further considers that no plants which interbreed can, according to this view, belong to distinct genera, and that any arrangement which separates such plants must be revised; that discrimination between species and permanent varieties of plants is artificial, capricious, and insignificant; and, consequently, that the question often raised, whether a wild plant is a new species or a variety of a known species, is a waste of intellect upon a point which does not admit of precise definition.

The fertilization of plants is supposed to be effected by the emission of tubes of extreme tenuity from the grains of pollen when applied to the stigma; these tubes pass down the style into the ovary, and eventually reach the young ovules, which without this contact are unfertile. The operation, so far as it can be aided by the hybridizer, consists simply in applying the pollen of one plant (which becomes the male parent) to the stigma of the other (which becomes the female parent). But there are certain conditions which are necessary to fertilization. The flower whose stigma is to be fertilized is to be deprived of its own anthers (if it is an hermaphrodite flower) before they burst and discharge their pollen, for in this case it would probably be self-impregnated, and then there would be little chance of success, for superfœtation, though not held to be impossible in plants any more than in animals, is equally an exception to the general rule, and therefore not likely to occur. The pollen must also be applied at the precise time when the stigma is perfectly developed and covered with its natural mucus, for otherwise it will not act; in other words, if the stigma is too young or too old, the application will be ineffectual. The stigma to which the pollen has been applied must be guarded from injury until after fertilization has taken place, or the application will be ineffectual. The time which transpires before this is secured varies in different plants; in some it is very slow, occupying a month and upwards. For the same reason, after the pollen has been applied, the pistils should be secured as far as possible from any chance of contact with other pollen, either by the agency of wind or insects, and especially should they be secured from being influenced by the pollen of their own species, for this is probably much more ready in its action than that obtained

from a strange plant. A very interesting fact connected with pollen has not until lately been fully proved; we allude to its property of keeping, without losing its peculiar vivifying powers, if stored in a proper manner. The principal conditions seem to be to keep it dry and cool by whatever means may be preferred.

M. Haquin, a distinguished horticulturist at Liege, has impregnated flowers of Azaleas with pollen kept for six weeks, and Camellias with pollen kept sixty-five days; and he even thinks that it would be quite effective if preserved until the following year, which supposition is confirmed by the experience of Mr. Jackson, a nurseryman in Yorkshire, who has found the pollen of a variety of *Rhododendron Smithii* to retain its fertilizing power for twelve months. Haquin's plan of preserving pollen is to gather the stamens just before the anther cells burst, and wrap them in writing paper, and place them in a dry room; he then collects the pollen they emit, and preserves it in sheet lead in a cool dry place. M. Godefroy suggests that two concave glasses, like those employed for keeping vaccine matter in, would be better. The globules or granules of pollen must not be crushed. This is, indeed, a most valuable fact connected with the subject before us, for upon a proper selection of pollen very much of success depends, and a store of this can therefore be laid by whenever it is procurable, ready for use as soon as an opportunity offers. Unless this were the case, the means of improvement would be very limited, for it often happens that the two kinds which it may be desired to intermix are not in flower at the same time, or at least not in the requisite degree of development.

In raising and blooming seedling plants in this way, there is one point which it appears to be of importance to keep in view, and that is, that, whether it be flowers or fruit, the real properties and qualities of the seedling are not at first to be detected, and therefore no hasty conclusion should be arrived at as to its merits. A very remarkable case illustrative of this point is on record:—when the late Mr. Knight raised the Black Heart Cherry, part of its first produce was sent to the Horticultural Society, and was considered so bad, that had not the tree been called the property of one of his children (who sowed the seed), it would have been cut in, and worked with something else; the after produce of this tree was of better quality, and the variety is now known as one of the richest of its class. This case appears to me to be decisive.

It may also be worth while to mention, that as no visible alteration in the appearance

of the seed vessels results from impregnation by another, this want of change is not to be considered as being conclusive of failure. Whether or not impregnation has been effected, is easily determined; for when this has taken place the stigmas soon wither, while those which have not received the pollen remain green and vigorous for a much longer time, varying of course with the duration of the particular flower. A change is generally to be noticed first in the petals, as in the case of the *Pelargonium*, in which they usually fall within three or four hours after impregnation, affording a convincing proof of the operation being successful.

It may be interesting to notice a few of the recorded instances in which definite results have been obtained. One of them is the case of some *Fuchsias* raised by Mr. Standish, of Bagshot, who crossed *corymbiflora* with some other kind, as *globosa*, and obtained but very moderate success in the first generation; these crosses were, however, again crossed with one of the parents (we believe *globosa*), and this result was some of the best varieties of *Fuchsia* which had then been raised. Mr. Knight impregnated blooms of a degenerate sort of pea with the pollen of a large and luxuriant grey pea; the seeds exhibited no perceptible difference from those of the other plants of the same variety, perhaps because the external covering of the seed was entirely furnished by the female; but in the spring the effect was obvious, for they grew with great luxuriance, and produced dark grey seeds. By impregnating this variety with others, the colour was again changed, and superior ones produced. In these experiments, when the pollen of a coloured blossom was introduced into a white one, all the seeds were coloured; but the opposite was not the case when the pollen of a white blossom was introduced to a coloured one. Lord Carnarvon obtained a mule *Rhododendron* by fertilizing *R. catawbiense* with *R. arboreum*. In this case the mule had the flowers and colour of the latter, and the foliage and hardness of the former. M. Gallezio procured more certainly double flowers by crossing those which were half double by others in a similar state. M. Fries Morel found crossed clove pinks to resemble the mother plant in form and the father plant in colour. The Dean of Manchester found that in crossing lilies, the plants produced resembled the mother plant in their leaves and stems, and the father plant in all their reproductive organs: this agrees remarkably with the result in the case of Lord Carnarvon's *Rhododendron*. Some very remarkable hybrid *Azaleas* were obtained by the Dean of Manchester from *Rhododendron ponticum* fertilized by *Azalea pontica*. In this

case there was little trace of the *Rhododendron* in the seedling, except in the tinting of the flowers, and to a certain extent in their arrangement: the evergreen habit of the female parent was totally obliterated. He also got a seedling between *Rhodora canadensis* fertilized by the *Azalea pontica*; in this case the hybrid partook decidedly of the foliage, wood, and habit of the *Rhodora*, its female parent, and in the flowers, which were of a yellowish colour, it followed the male parent. Many other crosses were made by the same distinguished botanist between *Rhododendrons* and *Azaleas*, and always with similar results; and it was on the evidence of these experiments of Mr. Herbert's that the genera *Rhododendron*, *Azalea*, and *Rhodora* have been amalgamated.

Captain Thurtell found that in cross-bred *Pelargoniums* the colour and spotting resembled the male parent, while the form approached more closely to that of the female. In the case of *Gloxinias* it has been remarked that in all cases when *G. rubra* has been fertilized with *G. speciosa*, or any of its varieties, the result has uniformly been a degeneracy in the colour of the varieties; the few which have been produced possessing any merit in this respect, have been obtained by crossing with *G. candida*.

The mode in which colours act in hybrid crosses is singular. When the bright yellow flower of the white turnip is crossed with the dull golden of the Swede, an intermediate colour is not obtained, but some of the mules as to colour follow one parent, and some the other. When a blue *Anagallis* is crossed with the orange-coloured, the effect is to discharge the yellow from the orange, leaving the dull red which was combined with it, whilst the blue is obliterated. In Mr. Herbert's *Rhododendro-Azaleas*, the purple of one parent, and the yellow of another, was succeeded in the mules by whitish flowers, more or less tinted with rose, and with a yellow blotch on the upper segment. Usually, however, it is most influenced by the male parent.

In the absence of better evidence than we possess on this subject, we think it may be assumed—

1st. That the characters of the male parent become more fully developed in the flowers and parts of fructification in the progeny, than those of the female.

2d. That the characters and general constitution and foliage of the female are to a great extent transferred to the progeny.

From these deductions, and other considerations we may venture to draw the following inferences, being fully aware, however, that the evidence is on some points conflicting, and even contradictory:—

Colour in flowers* seems generally to be most influenced by the male parent.

Form in flowers apparently more closely follows that of the female parent (this at least has been observed in the *Pelargonium*).

Size and robustness are communicated by either parent.

In seeds the colour of those of the male parent predominates.

In some cases the intended female flowers should be much less advanced than the other; the *Calceolaria* is an instance. Other plants, as the *Pelargonium*, require to be more advanced. The moment is to be seized when the stigma of one flower, and the pollen of the other, are in perfection.

Flowers intended to be crossed should be secured against the intrusion of insects *before* they become developed, and this protection must be continued till *after* there is evidence of impregnation being effected.

It is not requisite, as often stated, that the flower on both parent plants should be as nearly as possible in the same stage of advancement; it has been ascertained that pollen may be kept for any reasonable period, and when there is a store of pollen it is only necessary that the stigma should be properly developed—that is, fresh, and covered with its mucous secretion.

The anthers from the intended female flower should be removed *before* they are enough advanced to have burst their pollen cells, so that the pollen may not escape on to the stigma; a very small portion indeed of the natural pollen being sufficient to set aside any experiment.

A considerable quantity of the applied pollen should be used, it being less active than the natural pollen of the plant.

There must be a near resemblance, an accordance in general structure and affinity, between the plants to be crossed. Some are more difficult to cross than others, probably from the tubes of the pollen grains being too large to pass down to the ovary through the pistils.

It is not to be expected that every instance of attempting to impregnate flowers will be successful.

The number of fertile seeds is usually smaller in cases of crossing, than is natural to the particular kinds of plants.

Crossed plants being often less fertile, sometimes even sterile, are in the same proportion more luxuriant, and produce larger flowers.

Mule plants—that is, crosses between different species of the same genus, are usually either sterile, or become so in the second, third, or very rarely in the fourth generation. They may be fertilized by applying the pollen of either parent, and in that case assume the

character of the parent by which the pollen was supplied.

The fertility of a hybrid seems to depend more upon the constitutional, than the botanical affinities of the parents; thus, Mr. Herbert found that *Crinum capense*, an aquatic, or swamp plant, impregnated either by *C. zeylanicum*, or *C. scabrum*, which affect drier habitats, produced offspring which during sixteen years proved sterile, while the same species impregnated by *C. pedunculatum*, *C. canaliculatum*, or *C. defixum*—all swamp plants, produced a fertile cross.

There is usually a greater probability of success with plants that have been accelerated by slight forcing, because there is less risk of the plants being fertilized by the accidental escape of the natural pollen.

Mr. Herbert found that in crossing some brilliant coloured flowers with others less showy, the seedlings produced flowers nearer the duller colour. This he attributes to (as he supposes) the climate being more congenial to the duller coloured parent; and he suggests that it would probably not take place in a climate more perfectly congenial to the more brilliant coloured parent.

Some of the best double-flowered hybrids—as of *Camellia* for example—have been obtained from single varieties impregnated by pollen from partly double flowers; that which is borne on a petal, or, in other words, on a petaloid filament, is to be preferred. Probably Indian Azaleas, in which they usually abound, might be obtained double in this manner. It is, no doubt, also important that the parent plants should be in a floriferous rather than a vigorous growing condition, if fine double flowers are desired. Pollen cannot always, though it may sometimes, be obtained from double flowers. Dr. Herbert observed a very curious morphological fact in the case of the myrtle-leaved *Camellia*, which for twenty-five years he had never seen to bear an anther except in one season, when all the flowers on every plant had them; but the seedlings by this pollen proved the worst he ever raised; he concluded from this, that the same peculiarity in the season, which induced the approach to a single flower, also disposed the pollen to generate single flowers.

After all, the results which are obtained will frequently vary greatly from what are supposed to be the general rules which influence this question, affording thereby a certain proof that they are far from perfect. It is to be hoped that spirited horticulturists will turn more of their attention to this subject, and institute experiments upon a methodical and systematic plan, for so only can we hope to have the errors of our opinions and practice removed, and their place supplied by undoubted truth.

* A cross between a rose or byblomen tulip, and a bizarre, is said usually to produce "tricolors," which are not prized.



THE GUTTA PERCHA TREE.

SOME interest naturally attaches to a plant furnishing a material like the Gutta Percha, which, although but recently made publicly known to Europeans, is found to be well adapted for, and is becoming rapidly applied to, various economic uses. Men do not "gather grapes of thorns, nor figs of thistles:" in like manner, the Gutta Percha gum is produced by a particular kind of tree, inhabiting tropical regions, an eyesight acquaintance with which tree may at least be formed from the accompanying sketch; and in this way, a fact in natural history, as important in its way as those quoted above, may be impressed on the mind. It is, however, only to the curious in such matters as these that the plant will present any attractions; it cannot be regarded as an ornamental plant, and possesses no physiognomical characters to render it especially worthy of cultivation in our hothouses—for it will need such protection from the rigours of our climate—except as part of a botanical collection.

The substance itself—the concrete juice of a large tree growing in Singapore, Borneo, and other Malay islands—appears to have first come into notice in 1842, but the tree which produces it was unknown, at least to European botanists, until it was detected by Mr. Thomas Lobb, by whom dried specimens were forwarded to this country, quite recently; we believe during the past year. From the materials furnished by the specimens sent by Mr. Lobb, and others from Dr. Oxley, the plant has obtained a name and a station in systematic botany: that name is *Isonandra Gutta*, and that station is in the natural order Sapotacæ. Other particulars published by Dr. Montgomerie furnish us with its local history; and daily experience is extending its

application to the arts and sciences. The name above given as that by which botanists will henceforth speak of the Gutta Percha tree, was applied to it by Sir W. J. Hooker, in the *London Journal of Botany*, whence many of our particulars are gleaned. The following is the definition of the plant:—

Isonandra Gutta, Hooker (Gutta Percha tree).—Sapotacæ.—A large tree, attaining a height of forty feet, and sometimes a diameter of three or four feet, furnished with a milky juice. The leaves are alternate on the branches, somewhat leathery in texture, and obovate, entire in outline, attenuated at the base into the largish petiole by which they are attached; they are green on the upper side, and orange shining beneath. The flowers are small, each singly stalked, more or less drooping, and growing in fascicles from the axils of the leaves; they are sub-rotate, with a short tube, and six ovate or elliptic spreading lobes; twelve prominent stamens are attached round the mouth of the tube. The fruit is egg-shaped, six-celled, each cell with one ovule; four of the ovules, however, become abortive, and the cells more or less obsolete. It is a native of Singapore, Borneo, and other Malay islands.

It is one of the largest trees of the islands where it grows, but its timber is of no value, the wood being peculiarly soft, fibrous, and spongy, pale-coloured, and traversed by longitudinal receptacles or reservoirs, filled with the gum, forming ebony-black lines. From the fruit is obtained a concrete and edible oil, which is used by the natives with their food. The gum possesses the singular property of becoming plastic like clay when gradually and thoroughly heated—as, for example, by dipping in hot water till heated through—and when in that state may be moulded to any

form; on becoming cold it regains its hardness and rigidity, and in this state is firm, but easily cut with a knife. This substance, though



Isonandra Gutta. (Flower magnified.)

only recently made known to Europeans, is even already extensively employed in many branches of the arts as a substitute for caoutchouc, being preferred on account of its having the property of dissolving without being vulcanised. Of the various forms and modes in which it is already applied, may be mentioned "tubing of all sorts; bougies, catheters, and other surgical instruments; goloshes; moulding for picture-frames and other decorative purposes; whips and thongs; tennis, golf, and cricket balls; driving-bands for machinery, for which it seems especially adapted; waterproof and enduring boot-soles; door-handles, walking-sticks, chess-men, handles of knives, swords, &c., buttons, combs, &c." The Malaysans employ it to make handles for their *parangs* or wood-choppers; but, except in this case, they make but slight use of it. Dr. Montgomerie suggests, among the less immediately obvious uses to which it is applicable, that of making raised types and embossed maps for the blind, as it takes a sharp clear impression, and is also tough and durable. He thinks, moreover, it would likewise be found serviceable in stopping decayed teeth.

A patent for the improvement of the manufacture of the Gutta Percha has been taken out by C. Hancock, Esq., who suggests several methods of purifying the substance, which usually, when imported, is much mixed with extraneous matter: thus, it may be dissolved by heat and strained; or it may be passed through a screw-press; or melted by the addition of rectified oil of turpentine, the solvent being evaporated upon filtering through flannel or felt. In every case, the gutta percha should form a residuum of the consistency of dough or putty, this plastic state being secured by maintaining a suitable temperature during the process. Moreover, Mr. Hancock would combine gutta percha, caoutchouc, and a substance called jintawan, in

order to form an elastic material impervious to water, varying the proportions according to the greater or less degree of hardness or of elasticity required. For making elastic bands a compound is used, in which fifty parts of gutta percha are combined with twenty-four of jintawan, twenty of caoutchouc, and six of orpiment or sulphuret. From a mixture of these Mr. Hancock also prepares a light, porous, and spongy material, suited for stuffing and forming the seats of chairs, cushions, mattresses, saddles, &c.; likewise springs of clocks, clasps, belts, garters, and string. Where the requisite is flexibility and elasticity, the quantity of gutta percha should be diminished; and where firmness is wanted, increased. By prolonging the process much hardness may be acquired, and moulds and balls of gutta percha will bear turning in the lathe like wood or ivory. By the mixture of sulphuric acid, or of a tenth or larger part of vegetable wax or tallow, any degree of solubility and softness may be acquired; or the composition may be used as varnish, to cover other materials, concealing any odour, and imparting a surface impervious to water. In printing and painting of silk and cotton, it seems applicable to many uses, for it amalgamates readily with colours; when interposed between two thin sheets of gold-leaf or tin-foil, it combines them firmly in one.

Many of the following additional particulars are gleaned from Dr. Montgomerie's account, in the *Magazine of Science*, 1845. He observes:—"I may not claim the actual discovery of gutta percha, for though quite unknown to Europeans, a few inhabitants of certain parts of Malay forests were acquainted with it. Many of their neighbours, however, residing in the adjacent native villages, had never heard of it. It was occasionally employed to make handles for parangs, instead of wood or buffalo horn. So long ago as 1822, when assistant-surgeon at Singapore, I was told of gutta percha in connexion with caoutchouc. There are three varieties of this substance: *Gutta Girek*, *Gutta Tuban*, and *Gutta Percha*, (the *ch* in the latter word being pronounced as in perch, a fish). The name is pure Malayan; *Gutta* meaning the gum or concrete juice of the plant, and *Percha* the particular tree from which it is obtained. I could not help thinking that the tree itself must exist in Sumatra, and perhaps derive its name from thence, the Malayan name for Sumatra being *Pulo Percha*; but though the Straits of Malacca are situated only one degree to the north of Singapore, I could not find that the substance has ever been heard of there or in Sumatra." On instituting experiments, Dr. Montgomerie ascertained that the gutta percha was likely to prove a valuable

material for those parts of surgical instruments which had been hitherto formed of caoutchouc, the latter having the inconvenience of being easily injured by damp and hot weather in the tropics. This suggestion was highly approved by the Medical Board of Calcutta, and the Society of Arts in London awarded its gold medal for the discovery.

The tree is found in many parts of the island of Singapore, and in the forests of Johore, at the extremity of the Malayan peninsula. Mr. Brooke states, that it is also common, often six feet in diameter, in the woods of Sarawak, and is called *niato* by the people, who are not, however, acquainted with the properties of the sap. Mr. Brooke also believes it to be plentiful all over Borneo, and probably on the thousand islands that cluster to the south of the straits of Singapore. Its frequency is proved by the circumstance that several hundred tons of the gutta percha have been annually exported from Singapore since 1842, when it first came into notice. There is reason, however, to fear that the supply must shortly decrease, from the wasteful mode in which it is collected, a noble tree of from fifty to one hundred years' growth being often sacrificed for the sake of twenty or thirty pounds of gum, which is the largest quantity any one trunk affords. The juice might, in all likelihood, be obtained from this as from other trees by tapping, and thus procuring a smaller quantity for several successive years; but this process is too slow for the Malaysians, and is the less likely to be adopted, because the forests are common property. The people fell the trees, strip off their bark, and collect the milky juice in troughs formed of the hollow stem of the plantain leaf, when, being exposed to the air, it soon coagulates.

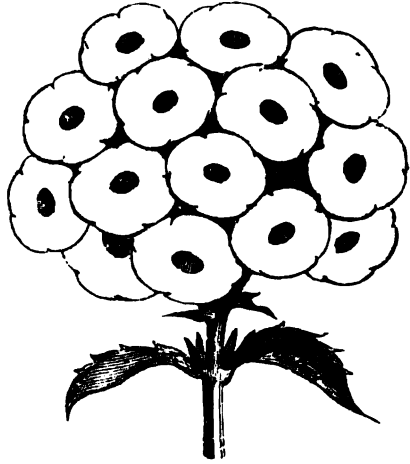
It is worth naming, that flowering specimens of the tree were sent in excellent condition from Singapore, to Sir W. J. Hooker, "protected by a thin box, of which the top and bottom were made of sheets of the gum itself."

We are not aware that living plants are at present in this country. We are, however, informed by Messrs. Veitch of Exeter, that their collector, who sent home the dried specimens already alluded to, has instructions to procure and forward some, which will prove valuable additions to existing botanical collections.

THE VERBENA, AND ITS PROGRESS.

We consider that a great advance is made in the form of this pretty and exceedingly useful flower. The petals of some are wide enough to touch at the outer edge, and if the same varieties that possessed this desirable width of petal had lost the notch, they would be approaching the standard very closely. There are others whose petals are not so wide,

but which have lost their notch, and if those had width of petal there would be little else required. There is, therefore, the greatest encouragement to the grower. There is no good reason why the seed of that which has lost the notch should not produce some with



wider petals, or the seed of that which is already wide should not produce new ones without the notch; at present we have nothing so good as we require, but there is no discouragement to our perseverance. Still there is a good deal to object to among the new varieties sent out. A florist makes up his mind that he must send out some new, whether he has any better than the old or not. A man who has taken all the pains required with a bed of seedlings, or a batch of seedlings,—for many pot them instead of planting out,—is disappointed if he cannot find something better than usual, but a few new ones he must have, and so the colour supplies the place of form, and accordingly a new half-dozen is selected for some peculiarity. But the great drawback is the notch at the end of every petal. We could forgive the narrowness of a petal, rather than the depth of a notch. We saw a new one last year called *Defiance*, reared, as we were told, at Chelsea. It was as vivid a scarlet as can be imagined—a bold large flower, a noble truss, and perhaps, we may say, deserved a certificate of merit as a new variety, but the notch was conspicuous; it had advanced in width of petal a little, but if possible it had receded with regard to the notch, which is enormous. There is plenty about it to justify its adoption in the best collections, but as much of its claim to notoriety arises from its noble truss and brilliant colour as from all the rest of its merits combined. We wish the raisers of these flowers would select, if not for selling for seedling, some of those which have lost the notch, for a verbena without that will be a most desirable improvement.



THE CAMELLIA JAPONICA.

BY GEORGE GLENNY.

THIS handsome evergreen and richly-flowering plant is one of the noblest ornaments of the greenhouse, and its robust and half-hardy constitution renders it one of the most desirable of floral subjects. It is a splendid shrub or tree,—for it is as easily cultivated one way as the other,—and is a generally esteemed favourite among the permanent ornaments in the conservatory. The varieties are extremely numerous, the species few; and we are indebted to English gardeners for most of the sorts in cultivation, very few having been imported from China, and these, with trifling exceptions, appear to be only seedling varieties like our own. Nothing can be less alike in the same genus, perhaps, than the diminutive Sasanqua, and the monster reticulata, while the double white, and its companions red and striped, and others, form a sort of middle class in size, and surpass both in beauty. None of the thousand varieties reared in England seem to follow either reticulata or sasanqua, so that it is possible they are distinct. Among the species and varieties earliest introduced may be mentioned Sasanqua and Semi-double Red in 1811; Double Red, 1818; oleifera, 1819; Kissi, 1823; euryoides and reticulata, 1824. Many have been received from the continent, and among them a number of rejected seedlings, bought in England, propagated and named abroad, and sent back with high sounding names and descriptions to be bought here, and by good judges thrown away as worthless. Florists who raise seedlings, save for their own novelties some that they consider best, and dispose of the others among persons who use

them for no other purpose than sending out as novelties; therefore in such cases the public suffer as badly as if the original raiser had sent them out, and in many cases he buys back, under some tempting description and name, some of the very plants he thought not good enough to name, and sometimes at a larger price than he obtained for the whole batch. It is not our purpose to inquire into the many hundreds of sorts that are now to be found in the various catalogues, nor to go into the merits of many which are so like each other, and so imperfect, as to be scarcely worth culture; but we shall give a few names of varieties that may be grown with credit, and describe our method of cultivation, which differs little perhaps from that of other people who have succeeded.

FIRST TREATMENT OF YOUNG PLANTS.

These generally come to us in a very small state. The imported plants frequently being the completion of their first growth from a bud, and not more than two or three leaves of the worked part, and often upon a stock of small size, in pots filled and matted with roots almost to solidity. These are the most difficult to manage of any, and if they were simply repotted in vessels a size larger, would be as likely to pine and die as to live. Many English plants purchased in from some nurseries will be found matted in the same way, though larger, and they are in as great danger, if merely shifted, as the smaller ones, but from there being more to cut at they would be headed in a little, to give vigour to new

growth, while the smaller ones have not a leaf to spare. The first thing, therefore, to do with a new young plant, is to turn out the ball and examine the state of the roots; if they do not fill the pot, the conclusion is that the stock is young as well as the plant, but it may be that the stock has been matted in a smaller one, and that the shift it has had has not been properly conducted; but if you see healthy roots making their way round the outside of the ball, there is no danger to be apprehended; they may be shifted, if the growth has been completed, into a pot a size larger, without disturbing the ball. If the roots are matted, take the ball out of its confinement, and soak it an hour to wet it quite through. If any part of the roots appear rotted, carefully remove them, and where they are in such a solid mat as to prevent free growth, remove enough to give the rest room to grow, and shake or wash all the mould out; better is it to cut the roots almost to the stump, than to leave on any that will not or cannot grow. Now take loam that has been formed of rotted turves; if they were cut thin, and the vegetation rotted in them, they will be found rich in vegetable mould, and would grow plants almost without any mixture; but equal quantities of peat earth and rotted cow dung, to the extent of one portion to three of the loam, will render it lighter and more porous. If the loam is of the top spit, and the turves rotted in, or the turves were originally cut very thick, the proportion of vegetable mould will be much less, and there must be vegetable mould or more peat and cow dung to compensate. If the loam be pretty nearly clean but of good friable quality—and it ought to be the latter to answer at all—one half loam and one fourth vegetable mould, and an eighth each of cow dung and peat earth, will do; upon the mixing of these all ought to be rubbed through a very coarse sieve, such as would let a hazel nut through, and when mixed, if it should appear too adhesive, which is not very likely, a little silver sand may be added until it is of right texture. Now take a pot of the proper size, fill one fourth with potsherds or crocks, then some compost, highest in the middle, enough to bring the collar of the plant (which is where the root begins) near the top of the pot; spread the roots out evenly and fill up, pressing the soil about the fibres and bringing the compost nearly to the level of the pot; well water, and plunge the pot into a moderate bottom heat, and cover with a bell or hand glass. Although it may be directly after they have completed their first growth, this will start them again, and they will make another season of wood, even in time to flower, if it were desirable; but, generally speaking, the object of an ama-

teur and that of a florist are widely different. The nurseryman or florist wants to multiply his stock as soon as possible, and therefore makes all the wood he can. The amateur desires to get a handsome plant as soon as possible, and that does not depend on the quantity so much as the form of the wood. Supposing then we have two of these miserable little plants repotted as we have directed, the one we leave to grow as fast as it will, the other we will suppose to have not more than two or three eyes. As soon as the buds begin to swell after the repotting, unless it is bidding fair to grow handsome, take out the top bud, or shorten the shoot to two or three eyes, but if the shoot already made indicates a disposition to grow handsome and throw lateral branches, leave all on, and as they grow, merely notice that no unhandsome growth be made, by stopping any joint that grows the wrong way or out of shape. The proper form for the plant is a well regulated bush, or a handsomestandard; we are now directing for the bush. The plants are to be watered rather liberally while growing, and when they are advancing pretty fast let the ball be turned out, to see if the roots have reached the side of the pot, and, before they begin to mat or cross each other, carefully shift them to a larger pot with the same compost, and return them to their place; they ought not to be checked in their growth, therefore the greatest care must be taken not to disturb the ball of earth or damage the roots, and the collars of the plants must not be sunk into the compost the least shade lower than they were before. Continue the watering while the growth goes on, but when there ceases to be any more leaves coming, and the foliage there is grows to its full size, they may first be lifted out of the plunging medium and placed on their own bottom; next, they may be removed close to the glass, and be shaded from the sun; next, to the greenhouse, still shaded; afterwards to a cold frame or pit; all of which time they are to have little or no water. This has so far saved a whole season of growth, and perhaps saved the plant altogether, for, as we have before observed, they do occasionally come so miserably weak, that before the growing season they would sometimes perish. The plants so pushed into second growth require care to ripen their wood, and ought not to be placed in the open air until this is effected. Cold winds, rain and damp, would be much against them, therefore there is no contrivance better adapted for them, until the wood is ripened, than a common cold frame or pit, which may be closed partly or altogether as wet or wind may render it necessary. When the wood is thoroughly ripened, it may be thrown more open to the weather, and up

to September may be on a shady border. The plants will occasionally, even with such second growth, be found set for bloom at the end of each shoot. If you are still anxious for growth instead of bloom, pick off the buds at once, for the plant stirs but little all the time the buds are swelling and the flowers blooming. In short, two complete growths may be had by taking off the buds, if there be any, and placing the plants in the greenhouse. But it may be that the pots are full of roots, and this must be looked to now and then, by turning out the ball and examining them, for the best rule for shifting plants is to do it when the fibres begin to meet next the pot. In the new growth, which will begin much sooner from having no bloom, the same watchfulness as to handsome form must be observed, except where the growth alone is wanted for stock, because in that case it matters not where it comes; the object is to get as many buds or joints as possible. It is not to be forgotten, too, that the growth would be still accelerated by increasing the temperature, for which purpose the propagator will even submit the plant to the coolest part of the stove, or place it in a propagating house, which is always kept at a much higher temperature than a greenhouse, either by means of a hot-water tank, or a bark bed, but the specimen grower will look more to the strength and beauty of the growth than its quantity. The joints are shorter, the leaves closer, and the habit therefore more compact when the plant is not hastened. These plants will have made their growth much sooner than those which are allowed to bloom; and while the propagator will carefully remove the bloom buds again, the amateur will probably allow his to perfect its flowers for the next blooming time.

PROPAGATION BY INARCHING.

Grafting by approach or inarching is a favourite mode of propagating the Camellia; for this purpose, healthy stocks of the single, or vigorously growing kinds are raised by cuttings, of which we shall speak hereafter, and are for this purpose procured two years old. A shoot of the plant which is to be propagated is bent towards the stock, the wood is cut quite square on the face, and nearly half way through. The stock is cut in a similar way, so that they fit together well; with a sharp knife a notch or slit is made, which forms a kind of tongue downwards in one, and upwards in the other, and these are tucked in a little way, so as to make the join more steady and complete, than when the two are merely bound together without the tongue, although they would unite even so. These are then placed so as to make the barks of both join on one side at least, which is all

that can be done if one is larger than the other, but if both stock and shoot are the same size the bark meets on both sides; the stock must be fixed so that the join may not be disturbed, and the plant and that be kept growing. The time of year for this operation is when the plants begin to push their growth, and the stocks are growing, and if the stocks are not growing so fast as the plant, it should be put in moderate heat and be forced, but when they are inarched they should both be put in heat, something more than the ordinary greenhouse, but not so warm as a stove. All the shoots that are to be inarched should be done at once, and the pots with the stocks in them so fixed, by props or otherwise, as that they cannot be shaken or disturbed. After a few weeks, say six at the least, or two months is safer, the ties may be undone, and the plants examined, to see if the union have taken place, which, if the join has been neat and the stocks in good growing order, is pretty certain; the shoot that is on the main plant may then be cut just below the join, the piece will be then fairly in the stock; when these are all cut off they may be put near the light, well watered, and the top of the stock that is above the join be taken off, and thus the whole nourishment of the stock thrown into the graft; when the growth is perfected they may be removed into a cool pit where they can be shaded, and they will require but little water. The greatest exactness must be observed as to the state of the plants when inarched; the buds of the plant ought to begin swelling, and the stock begin to grow. If the stock be at all bushy at the top, all but one shoot must be removed, and the graft ought to be performed below, on the thickest part of the stock, that is to say, as low as the work can be well done. With regard to the shoot of the plant, be guided by circumstances; if there be two eyes above the join it is enough, but as inarching, which is troublesome compared with other grafting, is resorted to for the sake of making good strong plants at starting, they are used much larger than would suffice; many who have favourite plants with a shoot that can be spared will procure a good stock to inarch it on, and be guided by the length they wish to get rid of as to how much they will join on the stock.

PROPAGATION BY GRAFTING.

This is the best way of propagating for amateurs, because it neither keeps the plants out of their places, nor makes a litter in the house; they have only to take care that the joins are made very neatly, fit very close, and are bound firmly, but not too tight. Of the many ways of grafting none need fail; from a small piece of wood with only a single bud on

it, to a good long scion, all may be made to unite; but much depends on circumstances, as to the mode employed. The stocks must be in a growing state, and the buds of the scion have begun to swell. The stocks are in general headed down, that all the strength may be directed to the scion. Suppose, then, we have only one bud on a small piece of wood, with the leaf attached; it may be cut wedge-shaped, and the stock, which should have a bud at the highest part, should be cut to fit the wedge. The reason for a bud being at the highest point of the stock is, that a current of sap should be maintained to the top, to promote the union. Another way of grafting with a single bud is, to cut the stock with a long, sloping cut, half way through, and the bud must be cut to match, and a slit ought to be cut upwards in one, and downwards in the other, so as to form a sort of steadying hold. A third mode of grafting with a single bud and its wood, is, by reversing the wedge; that is, by cutting the bud like a saddle, and making the stock the wedge; but it is not nearly so good, because you thereby lose the advantage of the leading bud in the stock. Another way of bud-grafting is, to cut the bud and the stock to fit each other, in some such way as carpenters mitre, so that the piece with the bud fits into the place mitred in the other; but the simplest is the first or second, and they are the safest to adopt. It must always be remembered that the bark of the bud or graft must touch the bark of the stock, and be completely fitted to it on one side, if not on both. There is only a necessity with regard to one side, when the stock is larger than the scion or bud; and hence it is quite certain that if a graft were put in the centre of a stock, it must fail; but that if the bark be fitted on one side it will unite; this is material. In grafting of all sorts a neat fit, the bark of both touching, ensures success, the reverse produces a failure. In grafting a good strong scion on a stock, it is a common thing to make the union in the middle, and to let the under half, which hangs below the union, go into a phial of water tied to the place, so as to feed it with water while it is uniting; but this is only desirable when the piece intended to be grafted is too large to venture with the limited nourishment of the stock.

The advantage of all kinds of grafting over the inarch grafting or grafting by approach is, that a man may use up all those shoots which may come off, without injuring the appearance of his collection of plants, and keep the plants in their proper situations, instead of being obliged to spoil the appearance of his best specimens, by either placing the pot of stocks about his best houses, or removing his plants to another place. Camellias require very different treatment for blooming and for propa-

gating by inarch grafting; consequently, if a handsome specimen have two or three shoots too long, or have here and there a shoot which could be well spared, he must, if he inarch it, submit the specimens to the treatment of the grafting-house, or bring the stocks into his show-house, and disfigure the plant by tying the spare shoots to stocks in pots, fixed all about it; whereas if they were cut off at once the plant would be improved, and they would do the grafting in a proper place, without interfering with any of the principal houses.

PROPAGATING BY CUTTINGS.

This mode is seldom practised for any but stocks, because of the time lost in the getting up of the plants to any size, and the generally less healthy and vigorous state of the plant in advancing years. Many of the varieties of Camellia are naturally delicate, and their growth weakly, compared with others. All the singles, and many of the semi-doubles, are of exceedingly robust habit, and these are selected for stocks. Two joints are enough for a cutting, one under ground and the other above; but as there is generally plenty of stuff to be had adapted for stocks, the ends of shoots are mostly selected, two or three joints above the soil and one joint under, because they sooner make large plants, and the top bud takes the lead. The cuttings are prepared by cutting the wood away below the bottom joint and issue of the lower leaves, that the roots may proceed from the eyes there. A pot of the ordinary kind is filled thus: crocks, one third; compost, to within an inch of the top of the pot, levelled properly, and struck upon the potting table two or three times, to settle it moderately firm; the last inch is filled with silver sand, and the whole gently saturated with water. The cuttings are then placed very thick, not an inch apart, by sticking them through the sand to touch the compost, but not to go into it, filling the pot all but enough room round the edge to admit of a bell glass being covered over, and the edge being pressed into the sand; a little gentle watering with a fine rose closes the sand all about the stems; and they are to be covered with the glass and put into gentle bottom heat, and a paper over them for shade. The glass may be left a few days, say three or four, without being touched; but in the event of there being the least signs of dryness, water over the glass so that it may run down inside the edge of the pot,—the sand will soon be saturated. The glasses may be removed about the fourth day and wiped, the cuttings watered all over with a fine rose, and be covered again, the glasses being first wiped dry inside. Attention to these matters must be given every morning, but on no account

omitted more than one day. The lower compost, absorbing and drawing together, keeps the sand pretty dry, and every two or four hours they ought, by rights, to be refreshed, in case of the sand being too dry, and the glasses be wiped perfectly dry inside. In a few weeks these cuttings will begin to grow and root, for they will grow before they are actually rooted; and when thoroughly rooted they should be potted off into large sixty-sized pots, one in each. Put a lump of peat, or some moss, or some crocks, in the bottom of each, an inch thickness, then a little compost, highest in the middle; now take the pot of cuttings, and water them thoroughly; then strike the pot on the table, gently, on its side, and the sand and compost will loosen on the side that is upwards; do this all round by turning the pot, when by a jerk the whole ball may be delivered on the table. This enables you to remove them one by one, with all their roots. Hold them upright, one in the middle of each pot, resting it on the soil already there, or pressing it down a little, if necessary, and spreading the roots out all round the centre, but keeping the roots pretty nearly to the top of the soil—for none of the stems ought to be buried—filling up all round with compost, gently pressed down round the side. Well water them, and keep them under glass, shut up a day or two, all shaded. If quite convenient, they would be all the better for returning to a little warmth a few days, but they must be carefully shaded. When once they have established their roots and are growing again, you must be guided by your means as to how long you will keep them in the gentle heat of a propagating-house, or pit, or declining hot-bed—all of which are good for them; or whether you will pot them to make their growth without heat. When they have completed their growth, which under any circumstances will be in a few weeks after they start, and their wood is thoroughly ripened, or any time afterwards previous to their growing, they must be repotted into forty-eight-sized pots; and while under hand for this purpose, all the side and useless shoots may be trimmed off. The potting to be done as before, and all of the plants to be put into a brick pit, without heat, but under glass, for protection. Here they may make a second year's growth, in which state, or any time after, they will be in fine order for grafting. Many prefer very strong stocks; and although one year potted are often used, for new and scarce varieties two years old is as young as they ought to be; and so that they are repotted every year, and never allowed to be pot-bound, the older a stock is, the more rapidly does a new variety grafted or inarched on it become a considerable tree; the growth being not only more rapid, but also more vigorous

and more noble; for the foliage is larger, the bloom larger and more durable, and the colours better. Stocks are hardy and healthy enough to thrive in a pit or wooden garden frame or light, after they are once established; so that it is not only little trouble, but it is very desirable to keep up a number of healthy stocks of all ages, doing a few every year, and repotting them from season to season, so as to have always ready some of any size and about every age that they can be required, whereon to graft the prunings of the best plants, and any new variety you may procure, that it may be desirable to propagate.

MANAGEMENT OF LARGER PLANTS.

The Camellia is one of the least difficult to manage of any half-hardy evergreen shrubs. They require attention of the most ordinary kind, and not much of it. Their routine is to bloom, to commence a new growth all over, which, when completed, exhibits the bloom buds at the ends of all the shoots, to rest awhile, or do nothing but very gradually swell the buds, flower, and grow again. Many complain that their Camellias do not set well for bloom. There is one thing that will prevent them from doing so; and that is, a check while they are making their growth. This check may be occasioned several ways. Too great a change in the temperature they are growing in, want of pot room, want of moisture, want of good drainage, poor, exhausted soil: all, or any one of these, will occasion an imperfect development of the growing plant, and prevent it from forming bloom buds. It is not wise to make any changes of the pots while the plant is rapidly growing, because unless it be done with more care than is generally bestowed upon the operation, it gives a great check. When the plants are in a state of rest, that is, when the foliage has completed its growth, and before the buds begin to swell, it may be done, with care; but the safest time, and when the plant derives most benefit from it, is when the bloom has declined, and the plant is about to grow. By giving good pot room at this time, the plant is enabled to make strong, healthy growth. Turn out the balls of earth whole, remove such of the crocks or drainage as will come away without disturbing the roots; and take off as much of the surface mould as will come off without damaging the fibres. Then use a pot that is a good inch larger all round; that is to say, two inches wider across than the old one. Put in plenty of crocks, next a little of the compost, then place the ball so that it will be nearly even with the edge of the pot; fill up all round, pressing the compost between the ball and the sides of the pots, very carefully, with the finger, or hand, or a piece of wood; but on no account

disturb any of the fibres that are outside the ball. When this is properly adjusted, water, to settle the compost about the roots, and place them in a protected place—a pit, under glass, is the best; and shut them up two days, without opening them to the wind, or allowing the sun to shine on them. They may then be left to make their growth, either in the greenhouse, the conservatory, or the pit, which should be opened on mild days, to admit air and prevent them from drawing, and constantly watched, that they never want water; for while the growth is making they require a good deal of it.

In our practice we thought it worth while to have a canvass house, into which all the Camellias were removed the beginning of June, where they had all the benefit of the full air on warm days, though perfectly shaded from the sun by the canvass roof, which rolled up or down as required, and by the side blinds, which opened outwards, and could be set horizontally. It was as large as an ordinary conservatory; and all our hard-wooded plants, as well as the Camellias, were in it all the summer. The advantage of shading, without depriving plants of the light, is not half appreciated; and the still greater benefit arising from the supply of air through canvass, even when all closed down, to keep off high and dry winds, must be seen to be sufficiently valued. But as everybody has not got the convenience, it should be remembered that all the while the plant is making its growth, there should be no harsh wind admitted; the sun should not be allowed to shine full upon it; and every pains should be taken to prevent a check.

Another point is worth attending to, very carefully; and that is, as soon as the shoots commence growing, any that are in the way, or are growing in the wrong place, should be removed at once, to prevent the plant from exhausting itself in useless blooms. The exceptions to this are, when the plant is wanted to be propagated from, in which case all the wood may grow, to be cut off after it has ripened. The plants ought not to be disturbed until the growth has completed itself, when it is almost certain that the plants will have become thickly set for bloom. The plants may then be set in the shade, in any protected situation—the cooler the better—and there must not be any water given until the compost in which they are growing is getting towards dry. But, generally speaking, the rain affords enough. Yet, there must not be any flagging of the plants for want of moisture. It has to be considered that they are not growing, and consequently do not absorb much moisture. The hard-wooded plants, in general, would do best in the same situation, a sheltered spot; that is to say, protected against north and north-east winds, by a fence or wall, at proper

distance, and shaded by trees or canvass from the heat of the mid-day sun. They should also be on wood or stone, or paving of some kind, to prevent the roots protruding and laying hold of the ground, which causes a very dangerous check, when removed to the winter quarters. If they are necessarily placed on the ground, however hard it may be, the pot should be frequently turned round to prevent the roots from striking into the earth. Towards the autumn the bloom buds will be found to have swelled a good deal; and where they are too thick, some should be taken off. It is the habit of some to leave three or four in a bunch; this is bad, and they ought to be reduced before they are put into the blooming-house, and not more than one should be at the same joint, or if two, they should be on opposite sides of the stem.

THE CAMELLIA HOUSE.

A common greenhouse with a north or east aspect will do for Camellias, though we prefer the south for everything, and a shade to counteract the influence of the sun upon those subjects which did not require it; however, there is less trouble when the aspect is the other way. When it is time to remove the Camellias to the conservatory, or the house in which they are to flower, they must be taken up singly, and examined, first, as to the drainage, next as to the form and position of the branches, to see if any should be taken off, or shortened or trimmed in any way. Also some of the branches may require tying a little, one way or the other, to help the shape of the shrub or plant. The surface of the soil may be stirred as low down as it can be done without disturbing the fibres, and all that can be loosened may be thrown out, and fresh compost be put on the top to fill up the pots, which should be cleaned from any mud or dirt that has accumulated on them while out of doors. They may then be placed in the house, giving such ample room, that they shall not only not touch any other plant, but also have plenty of free air; because there is no longer any doubt that to the crowding of the plants in their winter quarters half the evils that assail them may be attributed. They should also be occasionally turned round, to prevent their growing to one-sided specimens, which they soon would if one side only were always to the light. There are many persons who prefer pits to greenhouses for winter quarters; but they are so ornamental, even without their bloom, that most people want them in their greenhouses and conservatories for the sake of their general appearance; and, again, it hastens their bloom. If they are wintered in pits, it is better to trust entirely

to the covering against frost rather than risk fire heat of any kind ; but the covering must be effectual, that is to say, thick enough to prevent the frost penetrating. As the buds begin to burst and show colour, they should be removed to where they are to bloom, whether it be the drawing-room, the conservatory, greenhouse, or other place ; and this in a mixed collection will be from November till April, according to the temperature in which they are kept from the time of first housing them. Nothing can be easier than to keep up a respectable bloom all through these months. In general it will be found that at the end of the autumn, when they have to be housed, there are some much forwarder than others, without any pains having been taken to make them so ; in this case you may make up your mind either to bring them into bloom all together, by placing the forwardest in cold pits, where they will be retarded, and the backward ones into the warmer houses, to bring them forward ; or they may be all served alike, and so keep up the long succession of bloom ; or they may be still widened in the period of their bloom by putting some of the forwardest where they will be still hastened, and so obtain bloom much earlier than they would come in the ordinary way, although set and swelled earlier.

The varieties of Camellia amount to several hundreds, but very few have attained anything like perfection. The *Althea* floras are confused in the centre ; the *Anemone* floras are little or no better. The only sorts that are at all worthy of cultivation are those which are improvements upon the double white and double red, those of which the petals are symmetrical, whole upon the edge, high in the middle, and approaching to a circular outline. Nevertheless, the plant is in itself so handsome, that even a bad flower is passable and will always find its admirers. Colour is a grand object. Stripes and blotches are run after ; and these characteristics carry some through a large circle of buyers when they have not any quality but that to save them. Tricolor, a semi-double ; *Doncklaari*, a semi-double ; and many others, which have neither form nor substance to recommend them, have nevertheless been purchased at a large price and in great numbers. They look rich as the flower first bursts through its green covering, but are nothing as soon as their flowers are fully developed. The list of varieties annexed comprises the best and most varied ; but it is of no use to pretend they are one-half of them good enough to please us. If we can believe the drawings of some American varieties, they have advanced beyond us considerably in the production of really

good qualities ; but we are so used to Yankee extravagances, not to say falsehoods, that we do not believe they have anything half so good as some recently introduced figures exhibited by Mr. Charlwood would lead us to expect. We mention these only incidentally. Nobody will be more happy than we shall to recognise any improvement upon the varieties we already possess in this country ; and as plants are already imported, we may be satisfied in the spring as to the quality of those alleged perfect flowers. In the calendar of operations we may perhaps enlarge on one or two points.

JANUARY.—The plants in pits are to have all the air that can be given on mild days. It is as well to keep them somewhat close in cold winds, but when the weather is pretty calm the glasses may be wholly removed ; but however warm the evening, it should not prevent the necessary precaution of covering up. In the greenhouse you are necessarily guided by other plants as well as the Camellia ; but the more air they can have the better. A little more care must be used where they are being forced, or are put into houses with higher temperature, such as graperies, conservatories, and forcing-houses. Some plants may be properly taken to houses of this description to hasten the flowering. Attend to watering, but do not give them too much ; they ought not to be watered until the moisture is greatly lessened ; then see that the drainage is good, and water the soil all through, for nothing is so deceptive and so dangerous to plants as to wet the upper part of the soil without soaking it all through. The lessening of the quantity of water in winter time for these and all sorts of plants is to be by less frequent applications, not by giving a less quantity when they are watered. Grafting may be done this month with plants required to be rapidly propagated, and especially the grafting with a single bud and its wood ; and any that indicate a disposition to grow may be done before they get too forward. This applies particularly to sorts with no bloom buds ; for having no flowers to take the remaining sap, branches will begin to grow the sooner.

FEBRUARY.—Those plants which are blooming may be placed where they are wanted to flower. If in the drawing-room, or any of the rooms in a dwelling-house, remember that they are to have no fire in the room to alter the temperature, as they will throw off their buds at any sudden check or any rapid excitement. Give air to them in greenhouses and pits as far as you can do it, and be careful that they are covered from frost at night. If the frost last all day, they ought not to be uncovered, and the greenhouse, although it may require a little heat, must have it care-

fully administered, as sudden change and too much warmth would cause the buds of the plants to fall, and set them prematurely growing; besides which, all the other greenhouse, and especially hard wooded, plants, are the better for being kept very cool, so that there be no frost. Grafting, inarching, or budding may go on partially with all such plants as are not required for bloom, or from which cuttings can be spared for the purpose. The stocks that are starting into growth are the proper ones to use; and by examining the whole of them, there will be no difficulty in finding some upon the move: if not, they should be put into the grapery, or some other house, with a little warmer temperature, and not used till they are started; nor should the grafts be cut off until the stocks are ready for them.

MARCH.—The blooms are now coming out of the early ones, and, as in last month, should be removed to where they are wanted. The conservatory has not a handsomer ornament than the *Camellia japonica*; and where there is one kept up at all, everything in flower should be taken, but especially this beautiful tribe. Whether it be here or in the dwelling-house, pay due attention to watering, which, as the buds swell and flowers grow out, must be more frequent, guided, however, by the state of the soil in the pot, and not by the period that may have elapsed since the previous watering. Those in pits require equal attention. As the buds swell, water will be more often required, and the drainage must be well examined, to see that none of the holes at the bottom of the pots are stopped. This, however, is soon indicated by the soil continuing moist when that in the other pots is comparatively dry. As the buds get nearer bursting, the plants should be removed to where they will be seen; and in the height of bloom they ought to be shaded wherever they are, as it will greatly prolong the period of their beauty. This month many will be in perfection. If the stocks are generally shooting, get grafts or buds, for the purpose of taking advantage of the state in which they are most certain of success, for it does not signify half so much whether the bud or graft is moving or not. All the grafted and budded stocks must be placed in gentle heat as soon as the operation is performed; and as the tops of the stocks are cut off for bud-grafting, let them be put in as cuttings, to bring forward as stocks hereafter. While upon the subject of grafting, we may observe that all the shoots which are of no use on the blooming plants may be taken away for the purpose of grafting or budding; so also may long shoots with no bloom be shortened, if it will improve the form of the plant. Weak shoots,

which come out here and there on matured plants, and give no hope of future strength to match the rest of the growth, may nevertheless be good for grafts, as the want of health and strength is generally not in the shoot itself, but at the base, from whence it proceeds; and the same little branch on a healthy stock would be as strong as any other. It is at this season, before the shoots have actually begun their growth, that plants should be trimmed into form; only omitting till they have bloomed those which are set for flower, and which may be as ugly and as out of place as any, for it is always desirable to wait for these until the flowering has passed. Cuttings of stocks may be put in. We have recommended two or more eyes—but we are informed that at a nursery in Kent the cuttings are used with only one joint above the surface and none in the ground, so that the under part, from whence the roots start, are not cut to joints at all; but even this can only be desirable when cuttings are very scarce.

APRIL.—The blooming season is now rapidly passing away, and the beauty of the plants fades in one after another. It will be well to look among them to see if there are none that would be better changed to a different sort by grafting or inarching with better kinds; in this case, it depends entirely on the form of the plant whether you work it close down below the branches, or use some of them for the sake of getting a plant sooner. If there be several branches which go out from near the bottom, a piece might be worked pretty close home upon all such as would help to form a good specimen; but as in general the sorts we should most likely work would be scarce, there would be more likelihood of our having no grafts to waste or spare, and the best way would be to work the stock as low down as possible. The whole vigour of the plant is then thrown into the single graft, which grows very strong and pretty rapidly; in fact, very much in proportion to the age and condition of the stock. What we mean by this working of plants that have bloomed, is this:—Perhaps among our collection, we have too many of one sort; the most ugly of these could be thus changed to another. Suppose we find sorts that we do not like: work others upon these stocks. Again; if anybody fancies he should like several sorts upon one plant, the best way then is to cut back all the branches, so as to form a skeleton of a plant, and work each branch pretty close, say from two to six inches, according to their situation, and the form it will make; many will leave part of the old plant to answer for that sort, but it is far better to serve all alike. Some of the favourite plants are bare in parts, but otherwise handsome; this can always be

improved by grafting pieces of the same variety on the bare or thin parts of the plant, and thus making new branches where they are wanted. It is in such cases desirable to inarch the new branches, because you can by such means have them of any size that is best adapted for the purpose. See to all the budded and grafted stocks, and prevent the stocks from growing, by rubbing off any buds that may chance to come below the worked part.

MAY.—The bloom being now virtually over, prepare for the growth of the plants. Shift all of the plants that have filled their pots with roots, without disturbing them any more than you can help; one inch all round will not be too much to increase the size of the new pot over that of the old one. Keep the ball entire; remove the surface a little, and some of the crocks if they will come away without disturbing the roots, but not else. Trim the plants into the form best adapted for making handsome growth. Some branches may require to be stopped by merely removing the end bud; others may want the side shoots, or extremely vigorous shoots, to be shortened or altogether removed; but allowance must be made for the probable growth of each stock, because you must calculate on leaving all on that grows, on account of the bloom always setting at the ends of the joints. After shifting and trimming, water, to settle the new soil to the old ball, and place them under glass for a day or two, well shaded, but not uncovered to give air for a time. They may then be placed where they are to grow. This should be in a house or pit, by themselves, where there is little or no change of temperature, not affected by the sun, which must, either by situation or artificial means, be kept from them, except mornings and evenings for a little while; and here their growth should be without a check, which alone causes these plants to become bare of bloom. When grown in perfection they should set for bloom at every branch. Use all the stocks, and complete all the grafting and inarching; and let all the plants under that operation have a little assistance by way of temperature—fire, or water, or tan heat, to keep them going during the night, and the sun kept off during the day. Now put in all the cuttings you can make for stocks, by cutting in all the lateral shoots from the unused stocks by you, and by topping them all, and put them into heat as directed. The stocks may be placed in the shade, out of doors, on some hard bottom to prevent the roots striking through the pots into the ground, and worms from getting into the pots. Look well to watering; repot the stocks that are not used for propagation, that they may be kept in good growing condition till wanted.

JUNE.—The bloom finished, do all that has been left undone from last month's directions. Look to all the grafted and budded and inarched plants; wherever they appear united, take the bandages carefully off to examine, and tie again somewhat more loosely. It may be unsafe to trust them without any tie at all, and it impedes their growth to continue the tight bandage on after they have united. Where inarching has been done, the ties of those which appear to be united should be undone and tied up again. You may also cut the grafted branch half way through, towards cutting off altogether, and cut off the portion of stock that is above the graft altogether; but in all these things regard must be had to the time the operation has been performed, and the appearance of the growth. In untying the bass matting with which the grafts have been bound together, begin so that if you, on taking off two or three turns, find the union not complete, you can make fast again; though in general, if well fitted, in six or eight weeks from the time they are done they will be found joined well. If the operation is not performed neatly and the joint made to fit very close, it cannot make a good union, and will be much longer in making any union at all. All the plants will require constant attention as to the watering, for while making their growth they absorb a great deal. The stocks must be looked to as well as the worked plants, for although out of doors, and where they can get all the rain, it will not be sufficient moisture, unless it be a very dripping season. Besides, if the drainage is good, three days after a whole month's rain would leave them as dry as if there had been only a day's rain. Therefore, whenever there are plants or stocks in the greenhouse, conservatory, or open ground, they must not on any account lack water, for that is a serious check to the plant, and fatal to the bloom.

JULY.—The plants have now advanced considerably in their growth, and the early ones, those which bloomed first and began to grow directly, may have completed their growth. This may be known by looking at the new branches; the leaves at the end will be as large as those of the old plants, and a bud terminates the joint or branch. If this bud be double, it is a bloom; if single, some check has prevented it from setting its bloom, want of water or pot room, or sudden change of temperature, or some other cause of a checked growth, has prevailed to the loss of bloom. In this case, let the plant be set out of doors to ripen its wood as soon as possible, and when ripened repot the plant if required, or if the pot be not much crowded with roots at the side, make the same pot do; put it into the propagating house, or a tan pit, or a cool part of the stove, to make its second growth.

It is just possible, by these means, to make it set for bloom; and when it has completed its second growth in the stove, let the wood ripen in the greenhouse, or conservatory. But all such plants as have completed their growth this month, and are set for bloom, should be put under canvass to keep off sun; where, however, the fullest air can be given in cloudy weather, and the sides be all open even in the mid-day sun—the roof alone being required to keep off the rays, except morning and evening, before and after the heat has gone. Attend to watering all those which are still making growth, or of which the leaves have not yet attained the full size. Look over the budded, grafted, and inarched plants; cut off all of the latter that have completed their union, and place them in the shade a little while. Take off all the growing part of the stock, that the whole vigour of it may be thrown into the graft. Release all the bandages from the bud-grafted plants; see that no part of the stock is growing, and all that are united properly may be put together where they may still have the advantage of the tan heat, and of shading by day. Pot off all the struck cuttings into sixty-sized pots; and after keeping them three or four days in the moderate heat of the propagating house, or of a declining hot-bed, let them be placed in a cold frame where they can be well watered, shaded, covered close in bad weather, and thrown open in mild, and there they may remain till the autumn, when they will have filled their pots with roots, and require to be potted into those of a larger size; or, if room be an object, they may remain in the same until the growing time in the spring. Look well now to the disposal of all the collection; for every plant will have completed its growth by the end of the month or the beginning of the next. In the event of not being able to put the plants under canvass, or in good deep pits, and of being forced to place them in the open garden, look out for the most sheltered place, where the mid-day sun will not reach them; or, if there be no such place, the sun must be kept off by artificial means.

AUGUST.—Little more is required this month than attention to watering, and turning such of the plants in the open ground as might otherwise grow through the pot and strike into the ground, which would greatly excite them in their season for resting, and give them such a check on removal as would effectually spoil them for a season. The grafted and otherwise worked plants may be growing, or at rest, or some each; for there is no answering for things put out of their way. Some of the bud-grafts will be growing rapidly, and these ought not to be removed from the propagating house; those which are evidently at rest

should be placed in a cool situation, and be kept much more dry than the plants that are growing. It is, however, not unusual to force the grafted plants into growth as early as possible, to get a second growth out of them, if practicable. If this be the object, let the ball be examined; and if the roots have reached the side of the pot, shift them, and replace them in the propagating house, or a cool part of the stove. Generally, however, where the plants are at rest, it is better to keep them so by placing them in a cool pit, and shading them from the extreme heat of the sun. If, however, any of them start into growth, encourage it by removing the plant into the greenhouse, where it will be more protected than it is desirable to keep those which are at rest and want coolness and plenty of air. This should also be done with all such of the plants in the collection as commence growing, for unless it be encouraged the plant will be damaged; the new growth not being matured will, perhaps, receive a check from cold winds while exposed to the open air. It is better, therefore, to remove it into the greenhouse, conservatory, or even into the dwelling-house, if you cannot find room in the stove or propagating-house, and it will be urged forward enough, perhaps, to set for bloom, and if not, to keep the growth healthy, and the foliage perfect, that would otherwise have been subject to blight or the attack of the fly or other pests, and so have been spoiled so much as to cause it all to be cut back.

SEPTEMBER.—The buds have now swelled a good deal, and where they are too thick they should be thinned; two blooms should not be allowed together, one would spoil the other, or both would be spoiled, besides in nowise contributing to the beauty of a plant, even if both would grow and bloom perfect. The buds should not be nearer than four inches apart; but at the ends, where many varieties will set three or four buds in a bunch, only one should be left, and that ought to be the most perfect and in the best position. It is now time to remove them to their winter quarters; some into the conservatory, some into the greenhouse, some in pits, according to their ultimate destination; all those intended to be thrown into flower early should be removed to the greenhouse, preparatory to going into the forcing house, vinery, or stove, wherever they are to be forced; but unless there be some especial object in very early flowers, it is better to keep them in their season, and to be content with the natural forwardness of some which will be always found to precede the main body of them. Place all the stocks in frames, for they are as well there as anywhere, and only require to

be covered in very severe weather, for the single and semi-double varieties are for the most part much harder than the double or highly fancy kinds. Water must be given now sparingly, and the drainage well examined before they are put in their winter quarters. Give all plants under glass abundance of room; pot off all struck cuttings not already done.

OCTOBER.—Little is now wanted but watching, and when really necessary, watering, but this can be only seldom, during the present month and next. The preceding remarks as to the treatment of the worked plants applies all through the winter. If they begin to grow, encourage them by taking them into the propagating house, and as the buds of established plants are now swelling, they must not be allowed to flag for want of water, although they must by no means be kept wet. Turn all the plants in the houses, so that they do not grow one-sided, for they would soon be spoiled if the light were only to come to one side of them, which is the case in almost all houses.

NOVEMBER.—This month requires only a continuance of last month's management, because the plants are only here and there throwing out an odd flower, unless regular forcing is going on, in which case a succession must be taken into the warmer house, and the places of those removed when forward enough must be occupied with the flowering plants that are to succeed them. They are always better removed from the warmth when the buds first show colour, and allowed to open their flowers in the greenhouse or conservatory, as they then last much longer in perfection.

DECEMBER.—Continue as before directed, and as mentioned in January, for the season is occasionally a month forwarder or backwarder, and the December and January months differ but little. When we observe that the season itself frequently changes places with the months, and the last and first differ but little; all the caution against frost and damp (the possible changes) required, are just as likely to be wanted in December as January, and in January as December.

PROPERTIES OF THE CAMELLIA.

The Flower.—1. The flower should be circular on the outside, when looked at in front.

2. The petals should be thick, smooth at the edges, broad and blunt outside, cupped or reflexed, as the case may be.

3. The petals should be imbricated (that is, each should have its centre over the join of the under petals); each row of petals should be smaller than the row immediately under it.

4. The number of rows, one above the other, should form the flower into half a globe.

5. The colour should be alike all over the

flower, if a self; and if blotched or striped, the contrast of the colours should be striking.

6. If the flower be white, it should be pure; and if white and coloured in mixture, the white should be distinct, and the outline of a blotch or stripe, where the white and colour joins, should be very decided.

The Plant.—1. The foliage should be large and bright, the leaves close together, the joints short, and habit bushy.

2. The flowers should come singly and at the ends of shoots, so as to bloom free from the leaves.

Long straggling joints, like the species called *reticulata*, are objectionable; foliage dull and small like that of the same kind, is also detrimental to the appearance, and therefore forms another objection; rough ragged blooms, however large and showy, are a great drawback, hence *reticulata* possesses a third very objectionable character, and no plant was ever more overrated. Pointed petals, like those of *Eximia*, are greatly against a flower, and in this case spoil a variety which has many other beautiful properties; open ragged-looking flowers like *Doncklaari*, however striking, are bad; and we may safely say, that there is no class of flowers, of which even the best, or rather the most esteemed varieties, are capable of so much improvement.

GENERAL REMARKS.

The *Camellia japonica* can be propagated every month in the year by cuttings. Stocks, therefore, may be always kept in all sorts of stages. We have given general directions for each month, but the growing or resting of the plant can be almost commanded at pleasure, and the only necessary condition of grafting, budding, or inarching, is that the stock shall be growing, and the nearer it is used to the commencement of its starting the better. Experience, convenience, means, and other circumstances, may dictate various expedients, and drive us from proper to improper seasons, but the foregoing directions have been founded on management which produced healthy, vigorous, and well-blooming plants in our own hands, and there can be no doubt, that although other modes may succeed, this cannot fail.

SELECT VARIETIES.

Flowers in the style of Imbricata.—*Ade-laide*, a very deep red; *Agnesi*, bright rose; *Alba Fenestrata*, pure white; *Amabilis*, a rosy carmine, occasionally speckled with white; *Beali*, *alias* *Leeana Superb*, vivid red; *Byzantina*, rose spotted with white; *Duchesse d'Orleans*, white tinted or spotted with rose; *Hendersoni*, *alias* *Lombardi*; *Jacksoni*, or *Landrethii*, delicate rose, bleaching towards the centre; *Imbricata*, rosy carmine; *Minuta*, rich cherry rose; *Palmer's Perfection*,

beautiful carmine ; *Prattii*, fine large bright rose ; *Pulcherrima*, a rich dark red ; *Queen of England*, delicate rose, striped with white ; *Sarniensis*, a beautiful carmine ; *Sherwoodi*, a bright cherry colour ; *Sulcata*, *alias* *Belle Irene*, white, with pale stripe in the centre of each petal ; *Venere*, brilliant red ; *Wallichii*, rich carmine.

Flowers in the style of the old double white.

—*Apollo*, a transparent rose ; *Aurora*, a salmon rose, marbled with white ; *Calypso*, pure white ; *Brochii*, cherry rose, striped with white ; *Candidissima*, pure white ; *Cœlestina*, delicate rose ; *Coquettii*, salmon rose, suffused with white spots ; *Cooperi*, reddish salmon ; *Elegans*, very large, and sometimes marbled with white ; *Estherii*, white, with rose flakes ; *Fordi*, salmon rose ; *Grunelli*, pure white ; *Harrisoni*, pure white ; *Helena*, deep poppy red ; *Henri Favre*, bright cherry rose ; *Hookeri*, pomegranate colour, spotted white ; *Imbricata Alba*, creamy white, striped with rose ; *Marchioness of Exeter*, beautiful rose ; *Marguerite Gonillon*, blush rose, striped and spotted with carmine ; *Mutabilis Traversi*, bronzy salmon, with white stripes ; *Negri*, carnation colour, spotted with red ; *Ochroleuca*, creamy white, with buff centre ; *Palatinus Hungaricus*, red, suffused with rose and white spots ; *Queen Victoria*, reddish carmine, striped with white ; *Rudolphi*, white, with broad blood-coloured stripes ; *Susannah*, blush rose, shaded with salmon, and striped with carmine ; *Woodsi*, fine rose ; *Wardi*, brilliant red ; *Carswelliana*, salmon red, striped with white.

NEW SEEDLING.

Countess of Orkney, very noble flower, not fully double, brilliantly striped with pale rose and deep crimson ; outline, very good, and the flower beautiful in all its stages, free grown, rich foliage and good habit.

GARDENING MEMORANDA FOR
FEBRUARY.*

In fine weather many things will be growing this month, though it is just as likely to be locked up in frost. As many things may require covering for a considerable period, it is always wisest to use transparent waterproof cloth, because all plants suffer in the dark when it is prolonged beyond its natural season ; consequently, when plants in pits are covered for weeks together, it is highly important that they be not bleaching in darkness. The flower garden begins to require attention. It is the month for planting ranunculuses for show, and the soil which has been turned over and over again by the side

of the bed to sweeten, has to be returned the first week. All the choice beds of pinks, pansies, and autumn planted ranunculuses, tulips, hyacinths, and other bulbs have to be protected very carefully, as they will be moving in fine weather and the young growth is easily damaged. Crops are being got in for the kitchen garden, and those which are growing require double vigilance. Frost comes when least expected, and if you have not provided for it much damage may result from it. All the unoccupied ground should be dug or trenched, and where manure is to be put on, it should be forked, dug, or trenched in, and not left long exposed. The stove wants strict attention to cleanliness ; the plants should be examined, and if any one or more have the least signs of the mealy bug, scale, or other vermin, they must be instantly cleansed, for these things multiply with such rapidity that a house and all the plants in it will quickly be overrun unless they are removed in time. Of the various means used to get rid of these pests, syringing with tobacco water, washing with soap and water and a brush, and syringing with clean warm water are the most effective. In the greenhouse there is no such danger of vermin. Old plants, such as large oleanders, and occasionally camellias and orange trees, will be found with the scale, and young plants, such as geraniums, cinerarias, calceolarias, and such like, will have the green fly. The former should be brushed off with soap and water, the latter require to be fumigated, for no washing or syringing will effectually remove them without the fumigation. For this purpose shut all the doors and windows very close, and, for want of a better contrivance, put some charcoal heated to redness in a dish in a heap, and a sufficient quantity of tobacco upon it, and shut it inside. A pair of fumigating bellows is better and quicker, but the former is effective. After the fumigation, syringe with lukewarm water ; this will also be found necessary with carnations, picotees, pinks, and pansies in pots within the frames, when ever the green fly makes its appearance.

THE TEMPERATURE AT WHICH PLANT-HOUSES
SHOULD BE KEPT DURING FEBRUARY.

The Greenhouse.—From forty to fifty degrees by day, and thirty-five to forty degrees by night.

The Conservatory.—From fifty to sixty degrees by day, and about forty-five degrees by night.

The Plant-Stove.—From sixty to seventy degrees by day, and from fifty-five to sixty degrees by night.

The Orchid House.—The warm or Indian house sixty to seventy degrees by day, fifty-five to sixty degrees by night ; the cool or Mexican house, five to ten degrees lower.

* A very elaborate and complete Calendar of Gardening Operations for February is published in No. 26 of the Horticultural Magazine.

SOLANDRA LÆVIS.

SOLANDRA LÆVIS, *Hooker* (smooth-leaved Solandra).—Solanaceæ § *Curvembryæ*.

The Solandras are nearly allied to the arborescent *Daturas*, one species of which, *D. arborea*, is perhaps as fine a plant as was ever introduced to our gardens. The Solandras, too, are plants of noble character and aspect, strong growing, of arborescent habit, having ample foliage, and large funnel-shaped blossoms. The present species seems to be of smaller growth, at least the blossoms are borne on plants of small size.

It is a branching shrub, of dwarfish habit, with trailing branches, which require to be trained around a cylindrical trellis; these

branches are smooth, as is every portion of the plant, the younger parts being herbaceous, and indicating a vigorous habit of growth. The leaves are oblong-oval, or somewhat obovate, and acute, thick, entire on the margins, and smooth on both surfaces; they appear to be small in proportion to the size of the plant, and that of those of the allied kinds; their attachment is alternate, by means of distinct purple petioles. The flowers grow at the termination of the shoots, one at the end of each; they are very large, almost a foot long, funnel-shaped, two inches across in the widest part, the mouth being a little contracted; the limb is spreading, three inches across, consisting of five lobes, which are singularly crisped and waved on the margin; the lower half of the



tube is very slender, encased in a tubular two-lipped calyx, four inches long; the tubular part is of a greenish cream-colour, the limb very pure white, and faintly reticulated. The blossoms are highly fragrant.

The history of this species is obscure. It was obtained by Messrs. Lucombe, Pince, and Co., of Exeter, under the name here adopted, from the Continent; but without any indication of its introduction into Europe, or of the country of which it is a native; a practice, unfortunately, general on the continent, and which cannot be too strongly condemned.

"Of the four species of *Solandra* described by authors," writes Sir W. Hooker, "not one accords with the present; nor is any now in

cultivation to be compared with it, for the size, and beauty, and fragrance of the blossoms. Young plants, not more than two feet high, produce its noble blossoms."

Messrs. Lucombe, Pince, and Co. find it of easy culture as a stove plant, in a moderately warm house. It grows freely in a compost of two parts turfy loam and one part turfy peat, giving it a liberal share of pot room, and abundance of light and moisture, so as to get a vigorously-developed growth, which must then be checked by affording it less liberal treatment, in order to the production of flowers. Cuttings planted in sandy soil, and plunged in a warm situation, will root freely.

NEW FLOWERS AND PLANTS.

CORYANTHES FEILDINGII, *Lindley* (Col. Feilding's Coryanth).—Orchidaceæ § Vandæe-Maxillariidæ.—A most remarkable epiphytall plant, producing the largest-sized blossoms yet known among orchids. "As usual in this genus, the flowers are pendulous and inverted. The general colour of the parts is pale brownish yellow, a little mottled, and stained with cinnamon in an irregular manner. When closed, the flower is about five inches long, and three wide. As it unfolds, the sepals and petals, which are membranous, and bear no small resemblance to bats' wings, turn back, seem to fold up, and finally hang drooping at the back of the lip and column, in which organs the singularity of the genus resides. The lip is borne by a thick horizontal arm, an inch and a half long, which proceeds from the top of the flower-stalk, and consequently from the lower end of the column. Right and left of its base are placed two softish, fleshy, pale, ear-like lobes, which are organs of secretion, a sweet fluid continually dripping from them as long as the flower is in vigour. At the other end, this horizontal arm expands into a convex cap or hood, hairy in front, but bald on the crown; a little compressed from the back, and two inches across in its principal diameter. From the cap hangs down a large fleshy goblet, smooth at the edges, flattened at the end, two inches deep, and as many wide, and connected with the cap by a hollowed, fleshy stalk, which is strongly marked by various transverse folds, warts, and ridges; into this goblet drips the honey secreted by the two ears at the base of the horizontal arm which carries the lip. On the side next the column the goblet is opened, and near the bottom of this opening it is furnished with three fleshy, sharp-pointed lobes, of which the lateral curve downwards, and the middle one stands erect, rising just high enough to come in contact with the head of the column, which grows downwards so far as almost to touch it. The column is a large, fleshy, club-shaped body, two inches and a half long, and throwing back its head till its bosom becomes so round and large as to be comparable to the breast of a 'puffer' pigeon. The head of the column divides into two short, flat, fleshy, curved arms, between which the anther is seated." (*Journ. Hort. Soc.* vol. iii. p. 15.) History unknown. It was purchased of Mr. Atkins, of Northampton, in 1842, by Col. Feilding, and first flowered at Street Aston, in 1844. Flowers in August. *Culture*.—Requires a hot, moist stove; to be grown in suspended open baskets, among turfy peat and charcoal; propagated by division of the plant.

SOLANUM DEMISSUM, *Lindley* (dwarf false Potato).—Solanaceæ § Curvembryæ.—A dwarf tuber-bearing herb, of the same nature as the domesticated potato, and probably not of much value compared with the varieties cultivated of that plant. It is remarkably dwarf, bearing flowers almost close to the ground, and then growing upwards and blossoming again at the height of twelve or fifteen inches. The foliage and stems have a grey appearance. The leaves are from four to six inches long, pinnate like those of the potato, with blunt sessile leaflets. The flowers are nearly circular, ten-toothed, reflexed, about an inch across, bright violet coloured, arranged in loose terminal dichotomous, somewhat scorpioid racemes; they are succeeded by smooth globular berries about as large as those of a black currant. The tubers are small, kidney-shaped, white, with white, crisp, semi-transparent flesh. Native of Mexico, "growing at 8000 to 9000 feet elevation." Introduced in 1847. Flowers in June and onwards. *Culture*.—Requires precisely the same mode of culture as the common potato.

SOLANUM CARDIOPHYLLUM, *Lindley* (heart-leaved false Potato).—Solanaceæ § Curvembryæ.—A tuber-bearing herb of the same nature as the domesticated potato, but probably of little value compared with the cultivated varieties of that plant. It has an erect stiff stem, about a foot in height, with smooth dark-green pinnate leaves, having deeply heart-shaped leaflets. The flowers are small and cream-coloured, and have considerable resemblance to those of the black nightshade (*Solanum nigrum*). The tubers of this species were small, white, and of a roundish form. Native of Mexico "at 8000 to 9000 feet elevation." Introduced in 1847. Flowers from June to September.—*Culture*.—Requires precisely the same mode of culture as the common potato.

SPIRÆA EXPANSA, *Wallich* (broad-panicked Spiræa).—Rosaceæ § Spiræidæ.—A fine dwarf shrub, covered in every part with soft short hairs, and having the young branches brownish green. The leaves are stalked, elliptic-lanceolate, simply serrated beyond the middle, dull yellowish green above, and whitish beneath. The flowers are small, pink, growing in broad flat terminal corymbose panicles—in wild specimens as much as nine inches across. Native of Kamaon. Introduced about 1846. Flowers in July, remaining long in blossom. *Culture*.—Hardy; grows freely in common garden soil; propagated by cuttings of the half-ripened wood planted in the autumn.

HUGELIA LANATA, *Lindley* (woolly Hugelia).—Polemoniaceæ.—A novel and useful but not striking annual plant, growing about nine inches high, and quite white in every part, except the corolla, with a dense covering of short wool. The leaves are about two inches long, pinnatifid with linear segments, the points being somewhat spiny, and having from one to three short lobes or segments on each side. The flowers are borne in close heads arranged in a corymbose manner; they are gilia-like, of a clear light blue colour, with five long narrow arrow-headed projecting anthers. ? Native of California. ? Introduced in 1847. Flowers in summer. *Culture*.—Hardy; light common soil; propagated by seeds.

ARTHROSTEMMA FRAGILE, *Lindley* (brittle Arthrostemma).—Melastomaceæ § Melastomeæ-Osbeckiæ.—A light green, brittle, square-stemmed shrub, growing about three feet high, and covered slightly with fine glandular, scattered hairs. The leaves are stalked, about two inches long, ovate, slightly cordate, acute, five-nerved, finely serrated. The flowers grow in loose, few-flowered terminal cymes; they are an inch and a half across, with four oblong concave petals, of a deep rosy-purple colour; they are very fugitive, but being gray-coloured, and associated with a fine deep green shining foliage, make an agreeable variety. Native of the west of Mexico. Introduced in 1846. Flowers from June to September. *Culture*.—Requires a stove; grows readily in a compost of loam peat and leaf mould; propagated by cuttings.

PEPEROMIA PALLESCENS, *Miquel* (pale coloured Peperomia).—Piperaceæ § Peperomideæ.—An unornamental fleshy-stemmed plant, with soft, round, half-herbaceous branches, and cordate ovate leaves, which are either very slightly toothed or quite entire, covered beneath and on the footstalk with very fine hairs, and marked on each side with minute brown points. The flowers are ranged in green drooping tails about six inches long. Native of Guatemala. Introduced in 1846. Flowers from July to September. *Culture*.—Requires a stove; light sandy loam; propagated by cuttings.

LYCORIS STRAMINEA, *Lindley* (straw-coloured Lycoris).—Amaryllidaceæ § Amaryllææ.—A pretty bulbous plant, nearly allied to *Lycoris aurea*, but differing from that plant in having pale straw-coloured blossoms, with a pink line along the middle of the segments, and a few scattered dots; the segments are also shorter. Native of China. Introduced in 1845. Flowers in August. *Culture*.—Probably as hardy as a Narciss; grows freely in rich garden soil; propagated by offsets from the old bulbs.

ONCIDIUM TENUE, *Lindley* (thin-bulbed

Oncid).—Orchidaceæ § Vandææ-Brassidæ.—A small and not very showy species, remarkable for its thin pseudo-bulbs, which, although two or three inches long, are not more than one-eighth of an inch thick in the middle, from which they gradually fine away to a sharp edge. The leaves are thin, short, oblong-lanceolate. The flowers grow on a slender narrow racemose panicle, the branches of which are nearly of the same length, each bearing three or four small blossoms, yellow mottled with brown. It is near *Oncidium suave*, and *O. citrinum*. Native of Guatemala. Introduced in 1841. Flowers in August and September. *Culture*.—Requires a cool stove; turfy peat soil; propagated by division of the plant.

ERIA LEUCOSTACHYA, *Lindley* (white-spiked Eria).—Orchidaceæ § Malaxææ-Dendrobidææ.—A handsome epiphytal species, recently imported by Mr. Low, and not yet seen in a healthy state under cultivation. The plant produced from its old bare stems nodding spikes between three and four inches long, densely covered with small creamy-white flowers. It is stated that the plant grows naturally in masses on the trees, the branches of which are fully exposed to sun; and that each stem produces several of these spikes of bloom, which are not unfrequently from eight to ten inches in length. When in this state the plant has a very neat and beautiful appearance. In the absence of leaves there is some doubt whether the plant is quite distinct from *E. floribunda*. Native of Borneo, on the banks of the Sarawak river. Introduced in 1846. Flowers in November. *Culture*.—Requires a hot moist stove; very open turfy peat soil; propagated by division of the plant.

ONCIDIUM PINELLIANUM, *Loddiges' Catalogue* (Pinelli's Oncid).—Orchidaceæ § Vandææ-Brassidææ.—A very beautiful epiphyte in the way of *O. spilopterum*. The flowers are large, very bright yellow, with dark brown blotches on the sepals, petals, and the base of the lip, the precise amount of blotching varying in different individuals; the apex of the lip is broad, somewhat kidney shaped, and of a clear bright yellow. The flowers grow in a second manner on the short branches of a small panicle. It is thus a very compact and neat habited, as well as a showy species. Native of Brazil. Introduced (according to Messrs. Loddiges) in 1841. Flowers in the autumn. *Culture*.—Requires a moist stove; turfy peat soil; propagated by division of the plant.

SOLANDRA LÆVIS, *Hooker* (smooth-leaved Solandra).—Solanaceæ § Curvembryææ.—A remarkable looking shrubby plant of dwarfish branching habit, producing somewhat trailing

glabrous branches, with alternate oblong-oval thick glossy leaves, attached by purple-coloured stalks, and having very large solitary fragrant blossoms growing at their termination; these are produced when the plants are quite small. The blossoms are individually a foot long, the tubular angled and two-lipped calyx being about one-third of the length, and enclosing the slender base of the corolla; beyond the calyx, the corolla gradually swells out so as to become funnel-shaped, and at the end it is divided in a limb of five spreading lobes, which are waved and crisped on the margin; the tube is a greenish cream-colour, the limb white. The branches are best trained around a cylindrical trellis. History unknown. Messrs. Lucombe, Pince, and Co. imported it from Continental gardens. Introduced in 1847. Flowers in the autumn and winter. *Culture*.—Requires a stove; turfy loam and peat; propagated by cuttings placed in a hot-bed.

HYPOCYRTA GLABRA, *Hooker* (shining-leaved *Hypocyrta*).—*Gesneraceæ* § *Gesnerææ*.—A handsome sub-shrubby plant, with erect unbranched stoutish succulent purple stems, growing a foot or so in height; the leaves are opposite, elliptic, obtuse, glossy; the flowers grow from one to three together from the axils of the leaves, and the latter being near together they are somewhat numerous, and produce a good effect; individually they are short, tubular, but excessively inflated, especially on the lower side; the colour is a rich scarlet, the small contracted limb being orange-yellow. Native of South America. Introduced in 1846. Flowers in June and July. *Culture*.—Requires a stove; light rich loamy soil; propagated by cuttings, set in a moderately dry warm place.

VACCINIUM LEUCOSTOMUM, *Lindley* (white-lipped *Vaccinium*).—*Vacciniaceæ*.—A pretty evergreen shrub, with erect angular branches, thick oblong nearly sessile leaves, and numerous flowers in short three or four flowered erect racemes, clustered in the axils of the leaves; these blossoms are pitcher shaped with an erect (?) limb, and are described by Mr. Lobb, the discoverer of the plant, as being "scarlet tipped with white;" as they crowd every part of the branches, and stand erect, so as to become displayed to the best advantage, they must be very ornamental. Native of Peru, at Veto, 8000 feet above the sea. Introduced in 1847 by Messrs. Veitch. Not yet bloomed in this country. *Culture*.—Requires a greenhouse; turfy peat soil; propagated by cuttings or layers.

BOWMANIA SPECIOSA, *Gardner* (beautiful *Bowmannia*).—*Asteraceæ* § *Labiatifloræ*-*Trixideæ*.—A very handsome herbaceous perennial, with a woolly stem growing four feet

high, and having large sized leaves not unlike those of a *Verbascum*; the flowers are orange-coloured, and grow in large panicles. Named by Mr. Gardner in commemoration of J. E. Bowman, Esq. of Manchester. Native of Brazil, on the elevated peaks of the Organ Mountains. Introduced by Mr. Gardner in 1841. Flowers—? *Culture*.—Requires a greenhouse; turfy loam and peat, well drained; propagated by division of the plant.

HOYA CINNAMOMIFOLIA, *Hooker* (cinnamon-leaved *Hoya*).—*Asclepiadaceæ* § *Stapelieæ*.—A climbing plant not remarkable for showiness. The stem is long, branched, twining, smooth, sending out short roots at intervals. The leaves are opposite, ovate-acuminate, somewhat fleshy, five nerved, and attached by short thick petioles. The flowers are in dense hemispherical umbels, at the top of a short peduncle which proceeds from the axils of the leaves; they are rather large, pale yellow green with a purple staminal crown. Native of Java. Introduced in 1846 by Messrs. Veitch's collector, Mr. T. Lobb. Flowers in July. *Culture*.—Requires a stove; turfy peat and loam; propagated by cuttings.

GESNERA PARDINA, *Hooker* (leopard-spotted *Gesnera*).—*Gesneraceæ* § *Gesnerææ*.—A rather weedy looking plant, from the preponderance of the foliage. It has a stoutish branched erect stem, of a foot and a half high, with large opposite, elliptic-acute, rather fleshy, strongly serrated leaves, and solitary blossoms from their axils. The calyx segments are large and spreading; the corolla an inch and a half or more in length, ochrey-red, yellow within, spotted, especially the limb and tube internally with deep red; the tube is slightly curved, and dilated upwards, the limb of five nearly equal rounded segments. The blossoms are very pretty individually, but not numerous enough to be effective. Native of Brazil, in the Organ Mountains. Introduced about 1844. Flowers in October. *Culture*.—Requires a stove; rich light loamy soil; propagated by cuttings.

ACACIA LEPTONEURA, *Bentham* (slender-nerved *Acacia*).—*Fabaceæ* § *Mimoseæ*-*Acacieæ*.—A very elegant species, growing five or six feet in height, with graceful slender branches, furnished with alternate phyllodia, which are two to three inches long, spreading, flexuose, filiform, with a sharp hooked point, rough on the surface, and minutely and copiously nerved, or striated, a section exhibiting a circle of air cells, one beneath each ridge or nerve; an oblong gland appears above near the base. The flowers are collected into little globular heads, of which two usually grow from the axil of each phyllodia, attached by short separate stalks; they are deep orange-yellow. Native of the Swan River

colony. Introduced about 1844 ? Flowers in April. *Culture*.—Requires a greenhouse ; turfy loam and peat ; propagated by seeds.

PREPUSA CONNATA, *Gardner* (connate-leaved *Prepusa*).—*Gentianaceæ* § *Gentianeæ*.—A very handsome herbaceous perennial, growing from one to two feet high, with thick succulent glaucous oblong leaves, attenuated at the base, the upper ones connate, out of which proceed about half a dozen pedicels, each bearing one large showy blossom, of which the calyx is much inflated and tinged with purple. Also called *P. campanulata* (Griesbach). Native of Brazil, growing on nearly bare portions of rock on the upper part of the Organ Mountains. Introduced in 1841, by Mr. Gardner. Flowers ——— ? *Culture*.—Requires a greenhouse ; turfy peat soil, well drained ; propagated by division of the plant or by seeds.

CLUSIA FRAGRANS, *Gardner* (fragrant *Clusia*).—*Clusiaceæ* § *Clusiæ*.—A large and noble tree in the forests of Brazil. It has broad obovate, obtuse, thick leaves, and its branches are loaded with large white polygamous blossoms, which have four petals, and numerous stamens ; these blossoms fill the atmosphere around with their delightful odour. Native of Brazil on the Organ Mountains, at an elevation of 4500 feet. Introduced in 1841, by Mr. Gardner. Flowers ——— ? *Culture*.—Requires a stove ; loam and peat ; propagated by cuttings of half-ripened wood, planted in sand, and placed under a bell-glass in heat.

IXORA JAVANICA, *De Candolle* (Javanese *Ixora*).—*Cinchonaceæ* § *Coffeæ-Psychotridæ*.—A beautiful evergreen shrub growing from three to four feet high, with opposite ovate-oblong pointed leaves, and terminal dense trichotomous corymbs of rich orange-vermilion-coloured flowers. The flowers in this genus are salver-shaped, that is, having a slender tube and a spreading limb ; this limb in the present species consists of four oval rounded lobes. The plant is similar to *I. crocata*, but different and somewhat superior to it in its flowers. Native of Java in the woods on the mountain sides. Introduced in 1846, by Messrs. Veitch. Flowers in June and July. Also called *Pavetta javanica* (Blume). *Culture*.—Requires a stove ; rough turfy peat soil, well drained ; propagated by half ripened cuttings planted in sand under bell glasses.

THIBAUDIA MICROPHYLLA, *Lindley* (small leaved *Thibaudia*).—*Vacciniaceæ*.—A neat little evergreen shrub, with smooth furrowed branches, and small leathery dark-green roundish-oblong, retuse leaves, somewhat resembling those of the box-tree ; they are nearly sessile ; with a few scattered minute

hairs on the under surface. The flowers are produced singly in the axils of the upper leaves, and stand nearly erect, projecting quite clear from the leaves ; they are tubular cone-shaped, with a small five-cleft orifice at the apex, and are said to be of a scarlet colour ; in dried specimens they appear purple. Native of Peru (stated to be at an elevation of 12,000 feet). Introduced in 1847. Not yet flowered in this country. *Culture*.—Requires a cool greenhouse ; turfy peat soil ; propagated by cuttings, layers, or by inarching.

PHALÆNOPSIS GRANDIFLORA, *Lindley* (large-flowered *Phalænopsis*).—*Orchidaceæ* § *Vandeeæ-Sarcanthideæ*.—A noble epiphyte nearly related to *P. amabilis*, but with much larger flowers. It is one of the finest of the race of Orchids. The leaves are longer than in that species. The flowers are produced in a raceme towards the end of a slender stalk ; they are a full white, with a stain of deep yellow on the front edge of the chief lateral lobes of the lip, and the cirrhi or tendrils at the apex of the lip are yellow. The upper sepal is ovate, the two petals very broad and rounded, without a small projecting point, and not at all overlapping the upper sepal ; the two other sepals pointing downwards are lance-shaped, and much longer than the lip ; the lip is curiously and very elegantly formed, the upper part is linear-hastate, producing from the apex two cirrhi ; at the base are produced two largish lateral lobes which are most developed in the direction away from the apex, and are somewhat wedge-shaped with rounded angles. Native of Java. Introduced in 1846, by Messrs. Veitch, and bloomed by J. H. Schroder, Esq. Flowers in September, and probably at other periods. *Culture*.—Requires a stove ; grows well attached to a block of wood and suspended ; propagated by division of the plant.

CLEMATIS TUBULOSA.

Clematis tubulosa, Turczaninow (tubular-flowered Virgin's Bower).—*Ranunculaceæ* § *Clemateæ*.

In this plant we have perhaps the most remarkable of all the species of Virgin's Bower which exist in our gardens. It is a herbaceous plant, growing eighteen inches to two feet high, somewhat woody at the base, and dying down nearly to the ground annually. The habit is erect, slightly branching, with stiff angular downy stems, tinged with purple. The leaves are large, remote, in opposite pairs, on long footstalks, smooth, shining, ternate, rhomboid-ovate, bordered by coarse mucronate serratures of a bright green ; the larger leaflets three inches long by two and a half broad ; the intermediate leaflets largest, the lateral ones unequal-sided. The flowers grow

in sessile corymbs in the axils of the leaves, on stalks about an inch and a half long; the whole upper part of the plant is thus as it were a dense panicle of blossoms; they are formed of four linear-oblong, thick, fleshy, silky sepals, at first erect and forming a tube, and then becoming reflexed at the apex, the lower half being slightly swollen; they are about an inch long when full blown, of an intense blue colour, and extremely handsome.

The species was originally found in the north of China by Porphyrius Kirilon, by whom its seeds must have been communicated

its annual growth being nearly or quite killed down in winter. In the garden of the Horticultural Society, it suffered much from the cold of the winter of 1846-7, so that probably it must be regarded as little more than half-hardy, unless it be in a dry sheltered situation. A very proper position for the plant is on rockwork; or it may be grown during summer in the open borders, and the roots either taken up and potted during winter, where the situation is unfavourable to their existence in the open ground; or else partially protected in the ground, especially against excess of moisture.

The flowering season is in August and September. It is a desirable and showy, as well as very distinct herbaceous plant, for autumn flowering in the open border.

ORNAMENTAL PLANTS,

THAT MAY BE GROWN IN THIS COUNTRY, BUT ARE NOT YET INTRODUCED.

It appears to us, that we shall be anticipating the wants of a considerable class of readers, by presenting them, from time to time, with notices of ornamental plants which are known to botanists and travellers, but which have not yet found their way to our gardens. This plan will in some measure afford a guide to cultivators as to what they may expect from particular districts and countries; and may be also indirectly the means of facilitating the introduction of such as are most desirable by furnishing to those who have non-botanical correspondents in foreign countries, materials from which they may be enabled to indicate what would be really useful additions to our cultivated plants. With this view we now introduce the following list of subjects, mentioned by Mr. Gardner in his *Travels in Brazil*; any of which would be welcomed to our gardens:—

Angelonia hirsuta. This plant occurs in a swampy place, at Bomfim, near the city of Bahia; it is a beautiful species with long spikes of large blue flowers.

Angelonia arguta (Benth). Found near Aracaty; it is a very pretty species.

Angelonia biflora (Benth). This was found on high land near the Serra de Pereira, between Aracaty and Ico; it is a very fine species, bearing long spikes of large bluish flowers.

Angelonia bracteata (Benth). A remarkable plant, being a fine climbing shrubby species. Found on the journey from Cachoeira to Rosario.

Chresta spherocephala (De Candolle). The bushy Campos, between Gerães Velhas and Cabeceira, yield this fine composite plant in great abundance; it grows about five feet



to the Botanic Garden of St. Petersburg. Dr. Fischer, of St. Petersburg, sent it to the Horticultural Society in 1846, but it appears to have found its way earlier to England, probably by way of the Continent. So different is this plant in appearance from a Clematis, that the Russian botanist who first described it was in doubt whether it belonged to the genus; it does not, however, appear to present any generic differences. Turczaninow describes the flower as unisexual, but this does not appear to have been confirmed by subsequent observers.

Clematis tubulosa grows freely in ordinary garden soil; and is increased by cuttings of the young wood, which root readily. It is, however, to be regarded as a herbaceous plant,

high, with large leaves, which together with the stem and branches are covered with a white woolly substance; they are much branched at top, each branchlet being terminated by a large globose compact head of purple flowers.

Chresta pycnocephala. Another beautiful species occurring profusely on woodless grassy hills nearer to Gerães Velhas.

Gomphrena officinalis (Martius). On dry grassy flats near Pasquada, this beautiful Amaranthaceous plant occurs sparingly. It is well known to the people of the country by its vernacular name *Para-todo*. It has a large tuberous root which is very much used as a purgative, and as its name implies is considered good for every complaint. The stem is about a foot high, hairy and leafy, and bears at its extremity a large compact head of crimson flowers.

Commilobium polygalæflorum (Benth). A beautiful large tree, belonging to the Leguminous plants. It occurs abundantly in the province of Goyaz, and is called *Sicupira* by the inhabitants. It is easily recognised at a great distance by its numerous large panicles of lilac flowers. An essential oil which is contained in the fruit is much used by the inhabitants to alleviate the pain of toothache.

Ipomœa hirsutissima (Gardner). Found in the upland Campos near Aldea do Duro. It is a beautiful plant, growing in tufts, about a foot high, and producing numerous large violet-coloured blossoms.

Bignonia sp. From the upland Campos near Aldea, growing with the last, which it resembles in habit. A beautiful plant, with numerous large lemon-coloured trumpet-shaped flowers.

Epistephium sp. The fields about here [banks of the Rio da Palma] were gay with this fine terrestrial orchidaceous plant, which grows about two feet high, bearing a spike of large rose-coloured flowers.

Diplusodon sp. An upland grassy plain in the vicinity of the Serra de Santa Brida, near Arrayas, is thinly covered with this plant, a beautiful little shrub, bearing a profusion of small rose-coloured flowers.

Kielmeyera rosea (Martius). Found in deep upland Campos, about Arrayas. It is an ornamental shrub, forming a small bush about a foot and a half high, producing numerous large rose-coloured flowers from which it has obtained the name of *Rosa do Campo*.

Chorisia speciosa. Found on the Organ Mountains. A large tree, a kind of silk-cotton tree, with a stem from five to eight feet in circumference, covered with thick prickles, unbranched to the height of thirty or forty feet. The branches there form a nearly hemispherical top, which when covered with

its thousands of beautiful large rose-coloured blossoms has a striking effect.

Peltophorum Vogelianum (Benth). A Leguminous tree, found near Penêdo. It reaches about forty feet high, and has a great branching top. The leaves are large, but very much subdivided, and very graceful, having more the appearance of the frond of a fern than the leaf of a tree. The flowers grow in racemes, often a foot or more long, at the ends of the branches, and are of a beautiful golden colour. "At a distance," Mr. Gardner observes, "it presents a more magnificent appearance than almost any other tree I have seen."

Allamanda violacea (Gardner). A very beautiful plant occurring about Olho d'Agua do Inferno. It is shrubby, growing about six feet high, and bearing an abundance of large violet-coloured flowers, not unlike those of *Gloxinia speciosa*. An infusion of the root of this shrub is a powerful purgative, and is chiefly used in malignant fevers.

Dipladenia tenuifolia (De Candolle). Found growing abundantly on the open and sandy places between Varzea da Vaca, and Angicas. It is a beautiful plant, particularly worthy of notice, growing not more than six inches high, with subulate leaves and pink-coloured blossoms, not unlike those of *Phlox subulata*. It is called by the inhabitants of the Sertao, *Cauhy*, and the tuberous root, which is of the size and colour of a large black turnip radish, is eaten by them when cooked, and is said to be very palatable; in the raw state it tastes not unlike a turnip.

Cuphea sp. Found on bare and rocky spots near Canavieira, where it covers large patches. It is a dwarf fruticose species, with small leaves, and bearing numerous purple flowers. "So much," writes Gardner, "did this plant at first sight resemble the heather of my native hills, that I imagined I had found a species of that genus: not a single species of heath has hitherto been detected on the American continent."

Salvertia convallariodora (St. Hilaire). A beautiful tree, with large leaves, and spikes of sweet smelling flowers, not unlike those of the horse-chestnut. It is the *Folha largo*. Found in various parts of Brazil.

Physocalyx sp. A handsome shrub of about three feet high, with numerous orange-red flowers, surrounded by a large inflated calyx of nearly the same colour. It is a Scrophulariaceous plant. Mr. Gardner found it in the province of Minas Gerães.

Lisianthus sp. Found in passing through the province of Minas Gerães, near Lavrinha; this species has beautiful scarlet flowers.

Mutisia campanulata (Lessing). Found in the rocky ascent of the Serra near Itambé. A really beautiful climbing composite plant, with

pea-like leaves. and large heads of bright scarlet flowers, which are gracefully suspended on long footstalks. The Mutisias are altogether very curious plants.

Franciscea sp. Found in a marsh a little distance from the Rio Parahybuna. It is a fine species, being literally covered with its beautiful purple blossoms. It grew where the water lay about two feet deep.

Buginvillea sp. Near the Rio Parahybuna this plant was met with, covering the road sides. It is very beautiful, the large rose-coloured bracts of its flowers rendering it a conspicuous object.

In addition to these, we may mention two or three remarkable plants discovered by Mr. Drummond, in Australia; and of which it is possible that seeds may have reached this country.

Hakea Victoria (Drummond MS.) "Near Mount Barren," writes Mr. Drummond, "I found a most extraordinary plant, a species of *Hakea*, growing twelve or fourteen feet high; the true leaves of the plant are seven to eight inches long, jagged, and sinuated, as in *Hakea undulata*, but by far the most conspicuous part of the foliage of this superb plant are its bracts, which make their appearance with the flower buds. When the plant is three or four years old, they are borne in regular whorls, each circle or whorl being from seven to nine inches in height, formed of five rows, which have each five bracts; the lowest bracts of the whorl are the broadest, and vary from four to five inches, the whole breadth across in full-grown middle-sized specimens being about ten inches; and they regularly decrease in size to the uppermost bracts, which are only about four inches across from outside to outside; each whorl is a year's growth of the plant after it bears the first flowers. The variegation of these bracts is so extraordinary that I almost fear to attempt a description. The first year they are yellowish white in all the centre of the bracts, and the same colour appears in the veins, and in the teeth which grow on the margin; the second year what was white the first year has changed to a rich golden yellow; the third year what was yellow becomes a rich orange; and the fourth year the colour of the centre of the same bracts, their veins and marginal teeth, are turned to a blood-red. The green, which has a remarkably light and luminous appearance the first year, varies annually to deeper and darker shades; and the fourth year, when the centre of the bracts has acquired a blood-red colour, the green of the same series is of the richest hue, while the whorls below change to darker and duller shades, until they ultimately fade into the dull and withered leaves of other climes. The flowers I have not seen. The stems and buds

of the upper series, which are the only ones unopened, are white and velvety; the other series contain seed-vessels, mostly with perfect seeds. To this, the most splendid vegetable production which I have ever beheld, in a wild or cultivated state, I have given the name of our gracious queen, *Hakea Victoria*. It will soon be cultivated in every garden of note in Europe, and in many other countries. I thought it incumbent on me to send *Hakea Victoria* in some form to my subscribers, and for this plant pressure is altogether out of the question, as the bracts break before they will bend in any direction. I tied up sixteen of the bract-bearing tops in two bundles, fastening them together with the creeping shoots of the black creeper (*Kennedya nigricans*), and slung them one at each side of my old grey pony Cabbine. The load, although not very heavy, was a most awkward one to get through the bushes, and he never bore anything so unwillingly. One specimen, fourteen feet high, I carried in my hand all the way to Cape Riche; but notwithstanding all the care I took, the brilliant colours in the bracts of this extraordinary plant were much faded before I could get it to King George's Sound."

Genithyllis sp. At about 2000 feet elevation on Mongerup in Australia, Mr. Drummond found a beautiful species of *Genithyllis*, growing to the size of, and having a considerable resemblance in habit and foliage to, *Beaufortia decussata*, but with the inflorescence enclosed by beautiful bracts, white and variegated with crimson veins; these bracts are as elegantly formed as the petals of the finest tulip, and are almost as large, hanging in a bell-shaped form from the ends of the slender branches. "I thought," he writes, "I could never gather enough of this charming plant; and I procured abundance of perfect seeds."

DIPLADENIA NOBILIS.

Dipladenia nobilis, Morren (noble Dipladene).—Apocynaceæ § Wrighteæ.

During the autumn of 1847, this very fine plant bloomed, somewhat imperfectly no doubt, in some of the principal nurseries in the neighbourhood of London. It has a somewhat peculiar habit; and there is perhaps some uncertainty as to how far cultivators may be able to mould out of it one of those compact bushy-looking plants which only are now prized by persons of taste; but its very handsome blossoms entitle it to receive a careful trial in this respect.

The species of *Dipladenia* which are usually met with in our gardens, have a twining stem extending to a somewhat indefinite length. *D. nobilis*, however, instead of this, produces a large roundish brown-looking tuber-like corm, from the crown of which the stems are



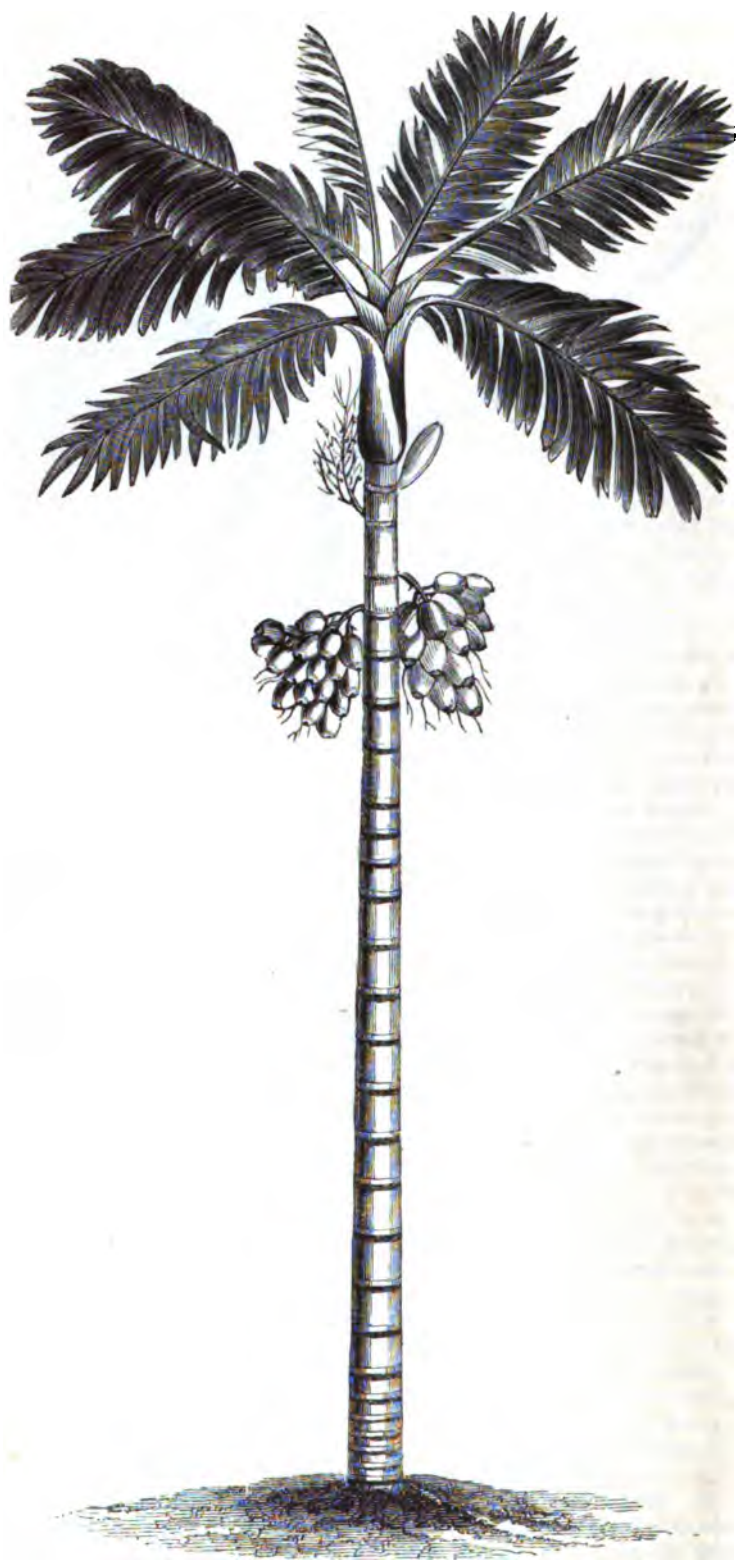
Belgian gardens, has its flowers entirely pink. They are moreover somewhat larger and more expanded in the limb, still narrower than the other at the base, and the lobes of the limb are more decidedly pointed.

The great fleshy corms of this species of *Dipladenia* were sent from St. Catherine's, in Brazil, to Mr. Verschaffelt, of Ghent; and plants in his possession exhibited at the Ghent flower show, in June, 1847, obtained a first prize. From some of the continental nurseries it made its way into this country.

produced, and these, after growing from two to three feet in length, terminate in a raceme of flowers. The success of producing a fine specimen under cultivation will apparently depend a good deal upon the facility or otherwise with which the plant may be induced to throw out a number of its stems from the crown. The stems are quite smooth, and as already remarked reach a height of from two to three feet; none of the blooming specimens which we have seen have attained a greater stature than this. The leaves are opposite, and are seated on so short a stalk as to be almost sessile; in figure they are oblong, rather acute at the apex, and rounded at the base; the surface is marked with the elevations caused by the numerous prominent curved veins with which the leaves are traversed. The flowers, which are large, and very showy, are produced in one-sided racemes at the top of the stems; the sepals or calyx-segments are narrow and sharp pointed; the corolla between bell-shaped and tubular, two inches long, very much narrowed at the base, and becoming widely expanded above into five roundish ovate lobes.

Two very distinct varieties appear to have been noticed. That which has bloomed in this country produces blossoms which are white near the border of the limb, and deep pink or rose in the throat and tube, thus giving the blossoms a deeper coloured eye or centre. The other variety, which has bloomed in the

It is of course a stove plant, requiring decided rest in the winter season, after its flowering season is past, and needing again very decided stimulus in the shape of heat, light, and moist atmosphere in the growing season. It must not have too rich a soil; peat earth and coarse sand well blended have been found to suit it. The plant is moreover said to require the full sun when flowering, its great fleshy corms enabling it to withstand any amount of solar heat. The great object of the cultivator should be to induce as many shoots as possible direct from the crown, which may, no doubt, be done by checking any strong ones which show a disposition to absorb all the growing energy of the plant. Our experience of the species does not enable us to say whether or not the stems may be successfully topped when they are yet inconsiderably developed, for the purpose of increasing the number of stems; nor are we certain whether the flowering branches previously alluded to are persistent, pushing out others, and so extending the length of the stem, or whether they die back, new shoots being produced to supply their places; the plants, however, when in a flowering state, gave no indication of extending their development. It may be propagated by cuttings planted in sand; and those shoots which spring from the crown should be preferred for this purpose, taking them when in a young state.



THE BETEL-NUT PALM.

THE BETEL-NUT PALM.

THE botanical name of this plant is *Areca Catechu*. It is a native of India, and according to Dr. Roxburgh, a botanist who in his day was familiar with Indian vegetation, it is the most beautiful and remarkable palm of that country. Magnificent indeed it must be, for it shoots up with an erect stem or trunk as straight as an arrow, quite smooth, and nearly of equal thickness in every part; this reaches from forty to fifty feet high, and is in general about twenty inches in circumference when full grown. This trunk is entirely without branches, but at the extreme top it is surmounted by a noble crest of beautifully pinnated leaves, or properly fronds, which are from three feet to three feet and a half long, their stalks being rolled up cylindrically at the base. The bunches of flowers, in their incipient state, are contained within a double membranous sheath, from which in due time they emerge; and they are succeeded by clusters of the fruit, or nuts, which are individually about the size of a hen's egg, of a yellowish red colour when ripe, and covered with a firm fibrous rind about half an inch thick. This rind or shell envelopes a soft white kernel, in the centre of which is contained a greyish and almost liquid substance, which becomes firm as the fruit approaches maturity.

This palm is cultivated throughout the East Indies for the sake of its fruit, of which large quantities are consumed in various Asiatic nations. The nuts are cut up into pieces, each of which is encased in a preparation of lime, and wrapped in the leaves of the betel pepper (*Piper Betel*). In this state they are chewed; and although they possess a strong narcotic or intoxicating power, and are offensive to Europeans, yet Blume regards the practice as very conducive to health in the damp and pestilential regions of India, where the natives live upon a spare and miserable diet. Blume indeed tells us, that the inhabitants of the countries where the practice is indulged in would rather forego meat and drink than their favourite *Areca* nuts; and that whole shiploads are annually exported from Malacca, Sumatra, Siam, and Cochin-china.

The Betel nut, or *pinang*, has an austere and astringent flavour, and is not eatable alone, but when mixed with lime—that of sea shells,—which no doubt destroys its acidity, and with the leaf of the betel pepper, it becomes milder and pleasanter. The mixture is, however, even then so very hot and acrid, as to be quite unfit for the use of any one not habited to it. It is reputed to be aromatic and stomachic, and also, as before observed,

narcotic, or intoxicating, but it is very doubtful whether these potent qualities really reside in the nut: some persons have supposed that they are rather attributable to the leaf of the betel pepper, than to any active properties in the nut itself. The latter, as prepared that is by the mixture of the three substances, the nut, the leaf, and the lime, has the effect of staining the saliva and the teeth of a deep red colour. The nuts contain a large quantity of tannin, and have been employed in some parts of India in dyeing cotton cloths. The leaf-stalks, spathes, and timber, are employed for many domestic purposes; and in Malabar an inebriating lozenge is prepared from the sap. A kind of spurious *Catechu* is also prepared from the fruit. In Malabar the trees, when old, are called *areec*, and when young *paynga*.

The natural order of Palms is the most noble of the whole vegetable race. An allied species of *Areca* (*A. oleracea*, the cabbage palm) grows from a hundred and fifty to two hundred feet high, and many others attain a great height. Almost without exception their habit is to grow up with a single undivided stem, at the top of which, whatever may be its height, a plume or crest of leaves or fronds is borne. Perhaps next to the grasses they are the most important order of vegetable beings. Wine, oil, wax, flour, sugar, and salt, says Humboldt, are the products of this tribe; to which Von Martius adds, thread, utensils, weapons, food, and habitations. Sago, and the various productions of the cocoa-nut, are perhaps the most important of these in a general point of view. Vegetable Ivory is also the produce of a palm: it is the consolidated albumen of the seeds of *Phytelephas macrocarpa*.

The Palms are nearly all stove plants, requiring a very high temperature and moist atmosphere. When their cultivation is attempted they require structures of considerable altitude, on account of the height they attain: unlike most other plants, these do not admit of the removal of the upper part to cause them to become dwarfer and bushy; in most cases such a practice would destroy them, as they very rarely produce more than a single stem. While young they may be grown in large pots, but as they increase in size their roots require much more space than can be afforded them in pots, and tubs must be substituted; and these again must from time to time be increased in size as the roots become numerous. A rich loamy soil, composed chiefly of broken lumps of turf, enriched by manure, and intermixed with rough lumps of charcoal, will suit them. In potting or shifting them, great care must be taken not to injure any of the roots;

they also require to be well drained. In winter, or while at rest, they may be kept at the minimum stove temperature, and both in the atmosphere and soil are better for not getting too much moisture. When they are growing, on the other hand, a very humid atmosphere should be kept up, as well as the maximum temperature; water must be given to them freely, and manure water occasionally to assist their growth. At all times, as in

the case of other stove plants, tepid water only should be used.

There are some Palms which never attain a very large size, and others may be kept small for a long time by not giving them very much encouragement. Such as these would form an interesting collection for an amateur, who, with a *fancy* for this noble race, had not an opportunity of growing the large kinds, or the others to their full proportions.

KEW GARDENS IN 1837, AND KEW GARDENS IN 1847.

IN the short space of ten years, one of the most complete revolutions, or reformations, that was ever witnessed, has been completed in the Royal Botanic Gardens at Kew. In the year 1837 there was scarcely a feature in the establishment that was not discreditable to the country. Mr. Loudon had for years been calmly remonstrating against the neglect that was apparent, and had given up the task in despair. At that time Mr. Glenny had, perhaps, not even seen them; but soon after the establishment of the *Gardeners' Gazette* by that gentleman, he undertook to expose a number of public abuses, and among them he numbered the mismanagement of the gardens at Kew. The following articles appeared in the *Gardeners' Gazette*:—

"We have had our eye some time upon the state of the gardens and plants at Kew, and have promised ourselves a little indulgence in our fancy for complaining. There is enough matter to feed our propensity for months. We begin then by roundly asserting that the plan of keeping up these gardens, and refusing the public the benefit of the collections under any circumstances, is both foolish and unnational. *The state of the place is slovenly and discreditable, and that of the plants disgracefully dirty.* If we fail to make all this out, we will confess ourselves no judge of the subject. The Kew Gardens are a sort of Government receptacle for everything new, good, or rare; and there is a kind of national pride, which, if the meanness of the Government willed it otherwise, would force upon them the necessity of keeping up, at any fair expense, the value of the collections. But, did the public, or did the founder of the establishment, ever contemplate that Kew Gardens were to be the last receptacle for everything? Was it ever supposed that a valuable acquisition to the country should be doomed to mismanagement there, and to be retained upon the dog-in-the-manger principle in the houses or grounds of that establishment, and refused to everybody? We say, *never.* It is a blot upon the establishment, that the only way in which it can be useful is neglected; and that when we do

procure anything from Kew it is through foreigners, who find it less difficult to obtain it, and who, when they do procure anything worth having, let the public get the benefit of it. Upon this point we shall have something more to say; but when her excellent Majesty reads the *Gardeners' Gazette*, which we hope is a favourite paper at the Palace, we trust some of our present and future remarks may fall under the royal notice; and we are quite sure the Queen will insist that gardens, kept up at no small expense, shall answer some good purpose. To the slovenly state of the place we advert, only to let our friend Mr. Aiton see that we have noticed it, and to inform him that we insist upon *a little more attention to cleanliness*; for any man who has been taught the art and mystery of sweeping a crossing could suggest many useful hints, and keep the place in better order. And, as to the state of the plants, it would serve our worthy friend right to make him tuck up his shirt sleeves and wash every inch of every plant with a proper brush and soap and water, until the myriads of bugs and other varieties of vermin with which they are infested are banished altogether. A new set of men, or a new master over them, has become indispensable, and we give Mr. Aiton notice to reform—or quit."—*Gardeners' Gazette*, Oct. 7, 1837.

"We are informed by a zealous defender of Mr. Aiton, that the Government does not allow him the means of keeping in order those gardens over which they have placed him. It is not for us to deny this fact, though we may regret that a man at the head of his profession condescends to fill an office without stipulating for the means of doing so with credit. However, *having begun the Herculean task of enforcing something like improvement*, one of our first steps shall be to procure a return of the expenses of the Royal Gardens, and seeing that either the evil or the gardens altogether be abandoned. The time is come when public opinion has its weight; the country can afford to be liberal for liberal institutions; but *it will no longer sustain large expenses for mock establishments or sinecure offices.*"—*Gardeners' Gazette*.

We are far from attempting to justify or qualify language that was by all accounts directed against an establishment with all the faults attributed to it; such as it was, we have given it, *verbatim et literatim*. But Kew Garden had its defenders. An anonymous writer in the *Morning Chronicle*, well known to be an authority, rebuked Mr. Glenny in a violent diatribe, as will be seen from the following article, taken from that paper :—

"To the Editor of the Morning Chronicle.

"Sir,—In several public prints, attacks on the Royal Botanic Gardens at Kew have of late been inserted. These attacks have been carried to an extreme degree in the *Gardeners' Gazette* of last Monday, where several articles of impeachment against these gardens are brought forward. On the style and spirit of these latter articles little need be said; they speak for themselves. Suffice it to state, that the writer repeatedly speaks of his friend Mr. Aiton:* now there is no person of that name at Kew; but it is evident that Mr. Aiton is meant, a gentleman well known to the world as a man of high attainments, as a useful and an intelligent public servant during a long life of honourable and efficient exertion; and who by his immediate acquaintances will be ever cherished on account of amiable manners and his kind and benevolent disposition.

"The repeated misnomer of Aiton would seem to prove that the writer in the *Gazette* is afraid of an action for libel; and that he has recourse to this subterfuge as a safeguard against the law. Be that as it may, I venture to say that he might have with great security proceeded on a more straightforward course; Mr. Aiton stands so firm in his own integrity, that he will not suffer the tranquillity which a good conscience and a well-earned reputation necessarily bestow to be ruffled by such uncalled-for and scurrilous accusations. To the public, however, if the gardens (as the writer in the *Gazette* assumes) are public property, it may be of some importance to know *what he thinks of these matters*, although they bear, on account of the above-mentioned subterfuge, the stamp of calumny and slander on their very face.

"I am perfectly unconnected with these gardens; but I believe that I may presume, from my studies, pursuits, and habits, to give something like an opinion. It is for the simple love of truth that I come forward, and I shall limit myself, in my statements, to such points only as may be easily verified by fair inquiry and by personal inspection. The gardens are open on every week-day, from

one to six o'clock, to the public. No ticket or admission fee, or, in fact, any fee is required; nay, so anxious is Mr. Aiton that the public should have no inconvenience on that score, that notice is given at the entrance that an immediate dismissal will be the consequence of the acceptance of any fee by the men about the grounds. Discriminating people will see that such facilities are not easily conciliated with the disreputable state in which these gardens are, according to the testimony of the writer in the *Gazette*. *Neglect, filth, and disorder would avoid, not court publicity.* With regard to the distribution of duplicates, it is clear that much discrimination ought to be used. To give rare plants to nurserymen, for them to trade with, would surely be improper; it could only be partially done, and the remainder would have reason to complain of those who obtained such preference. The practice at Kew is, to give plants only to parties unconnected with the money-making branch of botany; and, moreover, only to such as have a right to prefer claims on account of scientific acquirements and distinction. I do not think that any one whose skill, taste, and science entitled him to it, ever has asked in vain for any plant of which Mr. Aiton could well spare a duplicate. If foreigners have been so favoured, it only proves that they had a fair right to make the demand; and Englishmen, under similar circumstances, would have been equally successful. The writer of the *Gardeners' Gazette* is probably not aware that the republic of letters, the empire of science, know not of any distinction of birth; their sway is universal, and their subjects require not patents of naturalization.

"An establishment entirely kept up for the advancement of science, is not calculated to please the mere florist; it aims at a higher purpose than the exhibition of roses and dahlias. A hundred clever gardeners would not be sufficient, if every individual plant at Kew were to receive such attention as Mrs. Lawrence or Mrs. Marryatt bestow on those in their choice but limited collections. Its object not being gaudiness, and exhibitions for prizes, the plants may not be kept as neat as the *Gazette* writer wishes to see them, without missing the real object, namely, solid usefulness. Experience has taught, that an immoderate degree of care, a frequent handling and moving, is injurious to plants, quite as much, in fact, as permanent neglect. The medium course ought, and I believe is pursued at Kew, a place of pure scientific pretensions; whilst the man who wants to sell may be right to catch customers by excessive care and neatness, which perhaps facilitates sales, though the plants are injured.

* It was spelt "Acton" by mistake in the *Gazette*.

Complaints have been made that the plants are not named, but merely numbered, and the names entered in books kept at the offices. This system may possibly have some inconveniences, but it has been introduced to check depredations. The labouring men employed in such establishments, are frequently tempted and corrupted by dishonest traders; the mere numbering of plants renders the execution of such fraudulent orders, given by dishonourable men to corrupted servants, somewhat more difficult. In smaller towns, such as Glasgow or Dublin, practices of this kind are discovered with more ease; but near, and in London, the field for depredations is much more extensive, the receivers so numerous, the encouragement so constant, that, with every precaution, depredations must be expected, and are but too constantly perpetrated. To the scientific the inconvenience of numbers instead of names to the plants is of no importance; to others, it is still less so. Who, not a professed botanist, remembers one out of a dozen botanical names he may read or have read to him?

"To make such wholesale accusations as the writer in the *Gazette* does, is no difficult matter; still less so is it *anonymously to slander a worthy man*, calling himself at the same moment your friend, but mis-spelling his name *that the law may not reach you*. To prove such slanderous accusations to the conviction of a discerning public, *I know from personal inspection, which I have made as late as this morning*, to be quite impossible. I believe that, considering the *allowance made from the Civil List* for the Kew Gardens, they are kept in a corresponding degree of order and neatness, well calculated for the advancement of the science of botany; and I trust they will go on in 'the even tenour of their way,' notwithstanding these attacks, or those threatened to be bestowed upon them in the next number of the *Gazette*. As regards their worthy superintendent, I mean Mr. William Townsend Aiton, for *I am not afraid of writing his name as it really is*, I know that he has directed all his energies with great success, for a long series of years, to this establishment, with which he has been connected from his very infancy; and further, that he has a filial attachment for it, and that he has repeatedly disbursed *considerable amounts out of his own pocket*, rather than be troubled with applications to the Government, when anything decidedly beneficial to the gardens or to science has required such aid.

"I am, Sir, your obedient humble servant,

"A LOVER OF BOTANY, AND OF TRUTH.

"Turnham-green, Oct. 13."

This letter in the *Chronicle* provoked the

following answer, which immediately appeared in the *Gazette* :—

"It is difficult to understand such twaddle; but we have endeavoured to unravel some of the intentions of the writer. It may with some trouble be classed thus :—

"1st. A defence of Mr. Aiton's private character, as a gentleman of high attainments and a man of integrity, which *has not been assailed*; and an assurance that he will not suffer such 'scurrilous accusations' to ruffle his tranquillity. But the nameless slanderer of our *Gazette* has not dared to state what accusation is 'false' or 'scurrilous,' and as we defy him to point out a sentence which is either *false* or *scurrilous*, it follows that the skulking behind a sham name is exceedingly convenient for the propagation of wilful falsehood.

"2d. The discovery of a typographical error in the spelling of a name, and the assumption that it was intended as a 'subterfuge,' but our article of Saturday last, in which the name was spelt rightly, and which appeared two days before the above precious document, must have blown this flimsy fabric to pieces. *We care about a libel?*

"3d. Giving credit to Mr. Aiton for civility, *which has never been questioned*, and for abstaining from taking fees, when, in fact, if he dared to demand one, he would be instantly *dismissed*; and further, praising him for not avoiding publicity when, as a public servant, he no more dare to refuse admittance than dare the keeper of Hyde Park.

"4th. A denial of the practice of *keeping in plants*, in the same breath that the monopoly is defended; a gratuitous lie about those who have a right to prefer claims, and an impudent and ignorant assumption, that *no one who had a right to ask was ever denied a plant*. This can only cause a smile of ridicule.

"5th. An assumption that *we* may be not aware the republic of letters, the empire of science, know not of any distinction of birth. Their sway is universal, and their subjects require not patents of naturalization.' If, by this piece of special-pleading humbug, the nameless simpleton means to insinuate that foreigners are to be lavishly supplied from our national treasures with subjects denied to Englishmen, he upsets his own case; because, if there is to be *no favour*, and *all the world has an equal claim upon our national establishments*, ENGLISHMEN, WHO PAY FOR THEM, ought to have as great facilities as foreigners, which *we insist is not the case*; and we defy this unknown questioner of our attainments to sign his name to a contradiction.

"6th. There is a sneering notice, that Kew Gardens, which are constantly *kept up* for the advancement of science, are not calculated to

please the mere florist, but aim at a higher purpose than the mere showing of roses and dahlias; and an apology for filth and dirt, and bugs, and neglect, which any old char-woman would say could only come from a nasty dirty beast. Moreover, the ignorance of the creature is on a par with his impudence. After roundly denying that the gardens are dirty or the place neglected, he says:—

“‘A hundred clever gardeners would not be sufficient, if every plant at Kew were to receive such attention as Mrs. Marryatt or Mrs. Lawrence bestow on those in their choice but limited collections.’

“Why two ladies are to be dragged into the discussion by this unknown thing, we don't know; and if he mean to insinuate that those ladies bestow attention to individual plants, or that they interfere more with their establishments than other admirers of plants and flowers, it is a gratuitous libel upon both. They have clever, cleanly, and diligent gardeners, and liberal establishments, and there is no more care bestowed upon individual plants, than clever, cleanly, and diligent gardeners *ought and would bestow anywhere*. The sneer at exhibitions comes ill from a defender of filth and dirt in an establishment kept up for the advancement of science by exhibition only. We can tell the fool one thing which he seems not to be aware of, namely, that science has been advanced infinitely more by exhibitions from private gardens in three years, than it has by the Kew establishment in thrice the time; and to no two individuals has its advancement been more indebted than the objects of this anonymous scribbler's sneering remarks. But it is untrue to say a hundred clever gardeners would not be sufficient to bestow the attention required; and the observation that a nurseryman is obliged to be neat to force sales, while a national establishment *may be dirty*, is of a piece with the rest of this nasty creature's epistle.

“7thly. There is an excuse for having the plants numbered instead of named, which is, that it is a check to thieving. This foolish thing, then, supposes it more difficult to bribe a man to steal a piece of number 1150, than a piece of the plant if it had a name. The fact of its being unimportant to the scientific to have the names, and still less so to others, upon the ground that a man cannot remember names, is too ridiculous to answer. But we insist, that if the place be kept for the advancement of science, every aid that can be given by the names, by the places they came from, by classification, and all other means, ought to be given. If we follow out this dolt's argument, we might as well say, to the scientific the place is unimportant; and to others, it is less so; for if the scientific want

no assistance, Kew is of no use to them; and if the unscientific are not to learn, it is quite as useless to them.

“Lastly. We are told by this nameless thing—this trimmer between a knave and a fool—that we ‘anonymously slander a worthy man, and mis-spell his name, that the law may not reach us.’ Does not the creature know, then, that there are no less than five individuals answerable for every line in a newspaper? The blundering scribbler may consult the records of the Stamp-office any day for ours; and who is the contemptible shuffling thing that thus dares to call the leading article in a newspaper anonymous? Some fellow who dare not sign his name, who dare not write to us, but skulks into the columns of the *Morning Chronicle* under a sham signature, which he diigraces.—‘The Ass in the Lion's Skin,’ would be an apt illustration. *He* ‘A Lover of Botany and of Truth!’—Heaven defend both from such an acquisition!”

Upon this, the *Times* takes up the cudgels, and the following article appeared in the height of the war of words which Mr. Glenny maintained in a score of leading articles, in which he spared nobody, but was especially wroth with those who ventured to deny the truth of what he had written:—

“The attention of the public has been lately drawn to the state of Kew Gardens, by complaints which have been made from several quarters of the neglectful and inefficient manner in which the cultivation and preservation of the rare plants has been for some time carried on. A controversy, as is usual in such cases, has arisen in some of the public journals, and, as is also usual on such occasions, a good deal of acrimony has been displayed. There is some difficulty in knowing where to fix the blame, but it is beyond doubt that blame does attach somewhere, and to somebody, for the present state of what is called the ‘Botanical’ Garden at Kew Palace. Of the gentleman whose name has been mentioned in the controversy, and who has for many years held the situation of King's gardener, every person to whom he is known speaks in terms of the highest praise, and it would be most unfair, without the strongest evidence to that effect, to say anything derogatory to his industry, talent, and admitted scientific knowledge; nevertheless, it cannot be concealed from the eye of any unprejudiced person, that a great deal more ought to be done at Kew Gardens than has been done there lately, and that a survey of the place should be made for the purpose of introducing such improvements in the future arrangements of them as may be deemed expedient by scientific and practical

men, wholly disinterested in the business as to pecuniary profit, to their becoming what they were originally intended to be—a national garden for the cultivation of rare specimens of horticultural productions, from which duplicates could be obtained by growers for the diffusion of botanical science and national benefit. It is very plain they are not at present conducted on a system of sufficient liberality. There are difficulties in obtaining cuttings and duplicate specimens which ought not to exist. There does not appear to be any rule laid down as to the distribution of cuttings and duplicates; or if there be a rule laid down, it certainly is not a sufficiently enlarged one to meet the wants of the present state of horticulture in this country. The system of hoarding curiosities, from the ridiculous gratification of knowing that the hoarder has got something which his neighbours have not got, is the worst system in the world for the encouragement of science; yet this is one of the charges which have been made against the system at Kew. If it be a false charge, every friend to botany will be glad to hear it satisfactorily refuted by a plain statement of facts, and by a reference to the rules by which the proceedings at the gardens are regulated. If it be a substantiated charge, the sooner it is removed by an improved regulation for the future the better. Of another gentleman, Mr. Glenny, *the editor of several horticultural works, whose reputation has been assailed in the controversy, as being the impugner of the system*, it would be equally unfair to say any thing in dispraise, for having made himself active in inquiring into what he considers an abuse. *It is notorious to almost everybody that horticultural science is greatly indebted to his exertions in many ways, and he has a right, if he think proper, and so has every man*, to point out a fault in the conduct of a public establishment. The great fault in the management at Kew Gardens appears to be the adherence to a system of niggardly expense and exclusiveness. *There does not appear to have been the slightest progress in improvement for many years; the old conservatories and hot-houses seem crammed with plants, in a state of decay or stagnation; every thing looks dingy and dirty.* The larger plants, many of them of great rarity (and in a healthy state) and of great beauty, are cramped for room. The smaller ones, at least many of them, *have a shabby appearance.* There are not sufficient persons in the grounds to attend properly to the cultivation; it is understood that nine or ten men is the whole strength of the establishment, to look after the botanical garden and also the 'Arboretum,' which two divisions it is believed cover nearly six acres of ground. These men have to sweep the walks, grass-

plots, &c. In fact, there is not sufficient strength. It may as well be mentioned, that a little repair would not hurt one or two of the temples in the pleasure-grounds; and it would also be quite as well if the piece of water, once called the lake, but *now an unseemly pond, were emptied of its mud and filth, or quite filled up.*—*Times*, Oct. 31.

This led to Mr. Glenny being requested to attend a Committee of the Lords of the Treasury; but Mr. Glenny, while he insisted on the necessity of inquiry, declined taking any part in it, as he observed he had already given his report in print. Mr. Paxton, Mr. Wilson, and Dr. Lindley, were authorized to inquire, and their report confirmed every thing Mr. Glenny had written. In part of the report it was said that the place was in great disorder. The houses were represented to be "crowded together without plan or arrangement, all heated by separate fires, producing a quantity of soot and liable to many inconveniences;" and a very voluminous list of faults was contained in the report, which confirmed all, and more than all, that Mr. Glenny had stated, and not one contradiction. This led to the retirement of Mr. Aiton, the then gardener, who, it should be mentioned, *never had the means of keeping it up as it ought to have been kept up*, and to the appointment of Sir W. Hooker, under whose judicious superintendence all the improvements have been conducted and the gardens rendered what they now are, *an ornament to the metropolis and a credit to the Government*; but, as *the original cause of all this*, Mr. Glenny will always be associated with the regeneration and improvement of the Royal Gardens. In answer to some aspersions as to his motives, we find the following paragraph in a leading article, which we have not space for at full length.

"We trust the Committee appointed by the Lords of her Majesty's Treasury will give us credit for a desire to see the Royal Gardens worthy of the finest metropolis in the world, for it is impossible to trace or even to conjecture that, beyond a national pride, *we have the most remote interest in the adoption of our advice.* We may return to this subject, for we should glory in seeing the Royal Botanical Gardens useful, as well as ornamental, in the highest degree, to the great metropolis."—*Gardeners' Gazette*, Feb. 17, 1838.

As we have taken from the *Gardeners' Gazette* Mr. Glenny's condemnation of the Royal Gardens in 1837, we have procured his report on the state of the establishment at the present time. We do not hold ourselves responsible for any opinion he may give, nor express any of our own. The papers form together the history of the most remarkable event in the horticultural world.

MR. GLENNY'S REPORT ON THE STATE OF KEW GARDENS IN 1847.

HAVING made a considerable stir in 1837, 1838, and 1839, about the disgraceful state of this establishment, and caused (for no authority, from the *Times* newspaper down to Mr. Loudon, ever gave credit to anybody else for the movement) a total change in the management and the means of conducting it, we should have preferred to have seen all the alterations completed before we had reported generally. Like all other changes made by persons less than a professor or prime minister, nobody in authority ever states fairly the real author of the improvement. It is so humiliating to be indebted to common people for uncommon improvements, that although there are thousands to testify to our being the only though humble instrument, by which the movement was made, to change a dirty, foul, unhealthy, disorderly place, to something better, those most disgraced by the exposure, those called upon to confirm our statements and substantiate our charges, and those elevated to the office of superintending the change, alike agree that the original cause of the improvements shall be unmentionable. Of Mr. Aiton, under whose superintendence Kew was destined to ruin and decay, we say nothing disrespectful, because we believe he made the best of the miserable allowance vouchsafed for the maintenance of the gardens. If we ever blamed him in our thoughts, it was because a man of such eminence ought never to have lent himself to the degradation of the science under any circumstances. He ought to have flung away the office with just indignation, for a garden can no more be kept up without a sufficient allowance, than an army can be maintained without proper food and clothing. The allowance was not sufficient to even keep the place clean. Of the anonymous defenders of the gardens, the regulation and the condition of them, we cannot speak in terms of sufficient contempt; they fancied we were a part of that scribbling community who cavil at everything and know but little, but found us at least a match for the then governing powers, and not quite so ignorant as the old school of gardeners believed their juniors to be. Suffice it to say, that after a fair beginning we never let the authorities rest until the whole management was changed. We did not, like a friend of ours, write ourselves into a job, because, when requested by a Committee of the Lords of the Treasury to take an active part in reporting and suggesting, we pointed to the *Gardeners' Gazette* as our report and our suggestions, and declined the honour, while we suggested that Mr. Paxton was a practical gardener of great experience,

and a fit person to examine, report, and suggest, with Mr. Wilson and Dr. Lindley. It becomes us, however, to say no more than that the report of those gentlemen confirmed every word we had said, and this being done there was nothing left the authorities but the alternative we pointed out,—make the gardens worthy of the nation or destroy them. In a small Guide published by Sir W. Hooker, the public is led to believe that nobody but Dr. Lindley had been instrumental in the changes,—that he only had been consulted, that he only had suggested, and that upon his suggestion all the changes had been made. This is not fair. Sir W. Hooker ought not to exalt one man at the expense of the others. We never complain without foundation. Let us quote Sir W. Hooker to show this. He says :—

"Throughout the country an opinion existed, which soon began to be loudly expressed, that either the Gardens should be entirely abolished, or placed upon a very different footing, and rendered available as a great scientific establishment for the advantage of the public."—P. 10.

Now even this is not all the truth; not one word about Mr. Glenny's being the only complainant, and the daily papers defending the government, and the former persevering till he roused public opinion, and convicted the executive of all the charges; however, let us follow the writer of the Guide, he says,—

"Government was happily ready to respond to this better feeling, and in 1838 the Lords of Her Majesty's Treasury appointed a Committee to inquire into the management, condition, &c. of the Royal Gardens. The result was, that in May 1840 a return was made to the House of Commons, in the shape of a report by Dr. Lindley, at the desire of the committee, in conjunction with two well-known practical gardeners."

Why not name them? Mr. Paxton stood much higher than Dr. Lindley, and to his and Mr. Wilson's practical knowledge do we owe the best of the suggestions; instead of which, "Dr. Lindley's Report," "Dr. Lindley's description," "Dr. Lindley's suggestions," are mentioned, as if he were the only, instead of the least authority. Chatsworth bears witness to the taste and practical knowledge of Mr. Paxton. We should like to see some evidence of Dr. Lindley's practical knowledge; we hate comparisons, but they are forced upon us by a book that may be read by thousands, but which, to those who know the real facts, must appear at least disingenuous and unfair, perhaps the result of Sir W. Hooker's want of information, but none the less unfair for all that. However, having done justice to the parties concerned, by way of counteracting the want of true information

in that which purports to be a Guide, we proceeded to our duty. The result of all our stir, and the continued urging of the government, was that the management of the Gardens was taken from the Board of Green Cloth, and placed under the Commissioners of Woods and Forests, and the advantages of the change are manifest in the appointment of Sir W. Hooker, and the improvement of the Gardens.

The entrance to the Gardens is from Kew Green, through a noble pair of gates, and a wide straight walk through an extensive lawn. On the right stands the great palm-house, which in its present crowded state resembles a tropical forest; some of the plants so tall, that the enormous boxes in which they grow are obliged to be tilted, that the sloping position may make room for the head of the plant, which is higher than the highest portion of the roof. Here are enormous specimens of the various palms, musas, cocoa-nut, ivory palm-nut, the gum dragon-tree, ananas, papyrus, sugar-cane, *Cycas revoluta*, and other rare stove plants. The crowded state of this house can hardly be described, but the health and cleanliness of the plants, under manifold disadvantages, speak volumes in favour of the skill and labour at command. Some of the plants in these boxes can hardly weigh less than a ton, perhaps much more, for it is impossible to guess very nearly. The second house we come to is the old orangery, now used for the deposit of hardy greenhouse plants, half-hardy pines, &c. Here there are many noble specimens of conifers, *Araucaria Cunninghamii*, *braziliana*, and others; *Rhododendron arboreum*, *Laurus Camphora*, and numerous hard-wooded plants of great beauty. Here again we have to regret the crowded state of the place. There is already, when the building alone is contemplated, too little light; but the vast quantity of foliage renders it very much worse; nevertheless, there is every appearance of unwearied attention: the plants are clean, and far more healthy than anybody could imagine from the little room they are allowed. Next, is a small greenhouse with a miscellaneous collection of heaths and plants of similar habits. The propagating-house, numbered 4, we did not enter, but it appears well adapted for the purpose. No. 5 is a new stove, a sort of store-house for a varied collection of tropical plants. Our object, however, is not so much to describe the various and numerous curiosities of the vegetable world, as to report on their general condition, of which we can hardly say too much. Some of the rarest and most valuable plants may be found in this house, well worthy of marked attention, and from appearances, they are likely to be found here until the summer, when we anticipate a great

change in the localities of many. No. 6 partakes of the same character. A specimen of the *Sophora japonica* of large size attracted our attention in the open space, but of the specimens which abound in the ground we shall say but little; they were the least objectionable of the objects when we felt it our duty to the horticultural world to condemn the whole place, and, consequently, are the least indebted to the improvers. As we attended to the directions and the number of the houses, which was indicated by labels, together with a notice of the doors to enter, and those for exit, we next take No. 7, a large greenhouse containing hundreds of species of trees and shrubs, many from New Zealand, among which we observed the *Dammara australis*, *Dacrydium cupressinum*, *Phyllocladus trichomanoides* and *ferruginea*, and many other exceedingly interesting subjects from the New World, besides an endless variety of rare and established favourites, such as New Zealand flax, the Assam tea, evergreen beeches, and hundreds of New Holland, Cape, and other plants. No. 8 is the old stove, the first that was erected, and it contains a motley group of varieties; enormous cactuses, African aloes, dracænas, some extraordinary specimens of *Cereus senilis*, or old-man's-head cactus. No. 9 is a propagating house, the door of which we did not try to open. No. 10 is an immense house, rich in banksias, dryandras, proteas, acacias, epacris, &c. densely crowded. No. 11, the orchideous house, is the greatest treat to the ordinary observer; winter is not the best period of the year to see them to advantage, but they are beautifully grown, tastefully arranged, and extremely interesting, and we need hardly say that the collection is unique. They are growing on blocks, apparently cut from the tree with the plant attached, and in portions of cocoa-nut shell, and in small baskets. It is, perhaps, less inconvenienced by a superabundance than any of the other houses, but there are many more than there should be to show them off well in blooming time. In this house, though there are some of comparatively recent introduction, they all seem in excellent health, and fine growth. No. 12 is a house very much of the same character and form, but abounding in curious and rare plants; and among the most attractive both in this and the other stoves, are the ferns, some of which are of the most noble and remarkable growth. Nos. 13 and 14, opening into one another, are filled with the cactus tribe in all their varied forms, and unequalled, perhaps, as a collection, in any part of the world; those at all acquainted with this extraordinary tribe of plants, and succulents in general, of odd forms, may be

assured that all they have yet seen elsewhere, sink into nothing by the side of this unique assemblage. Among other curiosities in these houses may be mentioned some plants from Ichaboe (*Ceradia furcata*), whose extraordinary stunted appearance contrasts wonderfully with some of the inhabitants of the other houses. There are many duplicates in some of the tribes, and in none more than in the Cactus, Euphorbia, &c. No. 15 is a dreadfully crowded house, full of tropical plants, palms, &c., greatly injured in growth for want of room—the only evil which any of the plants in the establishment appear to suffer from in the present day. We observe nothing remarkable in the rest of the houses, which reach up to No. 22, excepting crowds of miscellaneous plants grown, or rather stowed away, under every conceivable disadvantage, and from their crowded state demanding an enormous sacrifice of labour and attention to keep them in health and some sort of order, but all remarkable for their general state of cleanliness and health. Of the out-of-door portion of the establishment it would be manifestly unfair to speak, until the plans are matured and the ground laid out. The new conservatory is a noble building, all covered in, and the substantial part apparently complete. The interior is heated by pipes and tanks under the floor and round the sides, and to all appearance ample provision is made for raising the temperature of the enormous space to anything that can be desired. We observe at present a lot of little clumps on both sides the long walk, which we object to for their insignificance, because on so noble an establishment there should be nothing on a small scale. The larger ones, which are merely bent bands, are too narrow, and those in the interior are more like the clumps of some little villa fore-court in the suburbs than portions of an area comprising so large a space. There is a want of boldness, a lack of dignity; the eye does not seem able to rest on a magnificent whole, but is interrupted by bits; still, as we have before observed, it is unfair even to remark upon anything unfinished. How much of the present plan may be intended to remain; how many of these children's flower-beds may garnish what should be a noble lawn; whether any of these baby gardens are to be permanent, or are to give place to noble groups more worthy of the size and capacity of the place, we cannot judge, and therefore we must not treat them at present as a part of Sir W. Hooker's plan. In like manner, we might find fault with a good deal of the old arboretum and with much of the present wood, but that we cannot tell how far it is to be altered. One thing we will say; that is, that the establishment in its present state

forms so great a contrast to its filthy condition when we complained or remonstrated, and caused the inquiry which confirmed our statement, that it is as if we had gone into a new world, with a new race of men to people it, as well as a new race of plants to furnish it; and we can well imagine that another year will complete the finest establishment in the world, and thus complete our triumph and fulfil our prediction that it should be worthy of the nation or destroyed before we had done with it. GEORGE GLENNY.



BEJARIA LEDIFOLIA.

Bejaria ledifolia, Humboldt and Bonpland, (ledum-leaved Bejaria).—Ericaceæ § Rhodoreæ.

The generic name *Bejaria* was originally given by Mutis to a plant allied to our present subject; it was so named in commemoration of M. Bejar, a Spanish botanist. Humboldt and Bonpland, in describing their South American plants, among which were several species of this genus, adopted the name *Befaria*, and both this name and *Bejaria* are retained by different authors.

In their general characteristics, the species of this genus are elegant alpine shrubs, with leathery leaves, and showy flowers, having something the character of dwarf *Rhododendrons*, to which genus indeed they are not very remotely allied. They are consequently Ericaceous plants, and belong to that section of Ericaceæ named *Rhodoreæ*.

Bejaria ledifolia is a shrubby plant, attaining, under favourable circumstances, a height of from three to four feet, with at the same time a much branching habit; it has therefore in its character all the elements necessary for the production under cultivation of a dense close spreading bush, the form under which ornamental plants are now re-

quired to be grown. The branches are of a purplish colour, and they are furnished with oblong leaves, somewhat mucronate, revolute on the margins, deep green on the upper side, and of a glaucous hue on the under side; they are moreover beset with glandular hairs on both surfaces along the middle nerve. Indeed almost every part of the plant is glandular; the younger stems with their branchlets, and the flower stalks, and the calyx or outer covering of the flower, being densely clothed with clammy glandular hairs. The flowers are produced in terminal racemes; they are of a rich purple colour, in size about equalling a moderate sized rhododendron. They have not yet been produced, as far as we are aware, in England; but most probably will be borne during the earlier part of the summer.

This species of *Bejaria* would appear to have been first introduced to this country in 1846; at least it is included in the trade catalogue of Messrs. Rollisson of Tooting, issued in that year, and is not enumerated in the *Hortus Cantabrigiensis*, published the year preceding. Plants of it were however introduced by Mr. Linden, from Colombia, and sold by auction in July, 1847. It is a native of South America. Humboldt and Bonpland found it in the alpine region of the province of Venezuela, near the top of Sella de Caraccas.

In our gardens it will prove a hardy greenhouse shrub, associating with Indian Azaleas, and the tender species of *Rhododendron*. Not much experience has yet been had in its cultivation, especially in growing it to a state of high perfection; but there is little doubt that its treatment generally must be made to assimilate in great measure with that successfully adopted with Indian Azaleas. A compost of fat turfy peat, well intermixed with silver sand, will be the proper medium for its roots. It propagates by means of cuttings, not too young, planted in sand under a hand-glass, and placed in a moderate heat. It may also be readily grafted on the *rhododendron* or the *azalea*, and in this way will soon form a fine plant.

STREPTOCARPUS REXII.

Streptocarpus Rexii, Lindley, (Mr. Rex's *Streptocarpus*.)—Gesneraceæ § *Cyrtandrea*-*Didymocarpidæ*.

This plant was called *Didymocarpus Rexii*, (Hooker,) but now bears the name above given. It is a pretty dwarf herbaceous perennial, growing with a tuft of oblong wrinkled leaves, from among which numerous slender pedicels rise to the height of six or eight inches, each bearing a largish bluish-lilac coloured blossom, somewhat funnel-shaped, divided at the end

into five unequal segments. These flowers are produced through the summer months. On well grown plants, these are so numerous as to form a very interesting object. It is a native of the Cape of Good Hope.

The *Streptocarpus* may be grown in a greenhouse, although it was formerly more usually placed in the stove. Its culture is very simple. The plants merely require potting into a compost, formed chiefly of light vegetable earth with a little peat and loam; and to be set in the front part of the greenhouse where they will be exposed to light, and kept moderately watered. This potting may be done early in March, the plants having stood through the winter on a warm dry shelf, and in small pots, during which time they require very little water—only just enough to prevent their shrivelling. They must not at any time be overpotted, as they do not produce very numerous roots; five-inch pots will be quite large enough for the final shifting, and these must be well drained; and great care must be taken in watering them after they are fresh potted, so that the soil is not rendered soddened. The plants must be kept on in the greenhouse, where they will blossom in company with the tender annuals which usually occupy that structure in the summer season.

The *Streptocarpus* usually produces abundance of seeds, from which it is best propagated, the seedling plants being more strong and vigorous than older ones. It is a good plan therefore to raise a few—as many as are wanted—every year, an equal number of old plants being thrown away annually after they have done flowering. These seeds should be sown about March, and a few more for later blooming plants, about May; they may be sown in pots of light soil, and set on a shelf in the greenhouse, the soil being covered with a layer of damped moss until the seeds begin to germinate. As soon as large enough, the plants may be potted singly into small pots, and subsequently the strongest of them may be shifted into three-inch pots, in which they are to stand the winter. In the following spring they are to be shifted for flowering, as already pointed out.

The structure of the seed-pod of the *Streptocarpus* is worthy of examination. Cursorily it would appear to form a small plain long quill-like body, similar to what is observed in the seed vessels of many cruciferous plants; but on examination it will be found to be twisted in a curious spiral manner, and the simplest way in fact of removing the seeds from their natural envelope is to untwist this, when they readily fall out.

Only the present species of *Streptocarpus* is known, and this is well worth cultivating.

THE ULEX OR FURZE.

ALMOST every one must be acquainted with the ever-blooming furze, the ornament of our barren wastes, and which covers the dreariness of the moorland surface with a mantle of gold. And can a plant, it may be whispered, so plebeian in its character, so common, and so simple,—can such a plant claim a place in the garden? Verily so; and not only is the Furze a welcome companion with exotic forms in the pleasure ground, and the artificial wilderness; but it even admits of cultivation as a valuable article of fodder for our cattle. The Furze bush is proverbially an ever-blooming plant. The story runs that, “Love goes out of fashion, when Furze is out of bloom.” The poets do not forget it; thus Cowper:—

“The common, overgrown with fern, and rough
With prickly gorse,* that shapeless and deformed
And dangerous to the touch, hath yet its bloom,
And decks itself with ornaments of gold,
Yields no unpleasant ramble.”

There is a dwarf kind of Furze, (*Ulex nana*), which is usually seen commingling its flowers with the purple blossoms of the common native Heath (*Erica cinerea*), these plants, both being dwarf and compact in habit, and very prolific of bloom, adorn the wild scenery of many parts of Britain with a beauty not to be imitated. We need not wonder, then, that the Furze should have attracted attention.

“Of all other bloom when bereft,
And Sol wears his wintry screen,
Thy sunshining blossoms are left,
To light up the common and green.”
Horace Smith.

It is said that when Linnæus first saw this plant flowering in this country, he fell on his knees, and offered up a prayer of thanksgiving to the great Author of Nature. It is also a singular fact, that our countryman, Sir J. E. Smith, the great follower of Linnæus, commenced the study of Botany with this plant. “I reached Birkenhout,” says he, “on the 9th of January, 1778, and began on the 11th with infinite delight to examine the *Ulex europæus*, the only plant then in flower. I then first comprehended the nature of systematic arrangement, and the Linnæan principles, little aware that at that instant the world was losing the great genius who was to be my future guide—for Linnæus died in the night of the 11th January, 1778.”

Ulex europæa, Linnæus (European or common Furze or Whin). This is, as its name implies, the most common kind. It is an evergreen erect spreading shrub, with linear-

lanceolate leaves, and rich golden yellow butterfly-shaped flowers, which are profusely produced from February to May, and in mild winters from September to May; individual plants being met with in bloom at every season of the year. It is very variable in size, the variations being as much as from two or three feet to ten or twelve in this country, and in some parts of Spain it is said to reach eighteen feet; a more usual size is four or five feet. It is found throughout the middle and south of Europe, in dry, sandy, or gravelly places, varying greatly in elevation, being found on the sea coast, and close to the water's edge, and as much as 2,000 feet above its level. It is sometimes killed to the ground by a severe winter, but usually springs up again from the root stock.

Ulex europæa flore-pleno (double-flowering Furze) is a most beautiful variety of the common kind, differing only in having double flowers, which are produced in the greatest profusion from April till June.

Ulex nana, Forster (dwarf Furze).—A much handsomer plant than the common kind, being of dwarf growth, much less spiny, and more elegant in its appearance. It is of a decumbent habit, rarely exceeding two feet in height, and generally not so much, though if planted in rich soil it grows larger; it is moreover in all its parts much smaller than the common Furze. It generally flowers, too, from the end of August to the beginning of December, and rarely at any other season. It is found abundantly upon poor gravelly soils, both in Britain and Ireland, and also in the west of France, growing at an elevation of 200 feet above the common kind. Being of dwarf growth, it would make a neat and pretty edging in rude scenery.

Ulex stricta, Mackay (upright or Irish Furze).—Another plant of very distinct habit from the two preceding, being perfectly erect in its manner of growth, and very compact, and attaining from six to ten feet in height; it is also much less spiny than the common kind. It was found in the park of the Marquis of Londonderry, in the county Down, Ireland, as early as 1815. Being much less free in producing its flowers, it is not so ornamental as the other kinds, but is very striking from its manner of growth; and as well as being tender and succulent, and thus affording excellent forage for sheep and cattle, its compact habit renders it well adapted for the formation of small and low fences in gardens.

Ulex provincialis, Loiseleur (Provence Furze).—A small growing plant, intermediate in its habit between *U. europæa*, and *U. nana*. It is an evergreen shrub, growing from two to four feet high, and flowering

* The Furze is also commonly known by the names of gorse and whin.

freely. A native of Provence, Andegavany, and Mauritiana.

A white flowered variety of Furze appears to have been mentioned by Gerard and Parkinson, as having been seen in the northern parts of England; but no such variety is known at the present time.

Another species, *Ulex genistoides* (Brotero), with the habit of *U. nana*, exists in some gardens; but is rather tender.

THE PANSY AND ITS PROGRESS.

BY G. GLENNY, F.H.S.

It is a strange thing, but no more strange than true, that florists, whether professional or amateur, are always advancing or retrograding; the science never stands still. We make great improvements in a flower, and while every year produces a better, all goes well; but the instant there is a lack of improvement, they all turn back to mere novelty, and seem perfectly reconciled to worse things. Nobody could have taken more pains than we have, to show what a flower ought to be, and to condemn, in a fair and proper way, those which are not worth keeping; but such has been the disposition to do business, that a florist who usually produces two or three good things each season, will if he fails offer bad ones. Other florists, who, if they only paid proper attention to the rules we have laid down, would at once see whether a flower is good or bad, select, even for purchase, varieties which have some condemning fault, and scarcely see it, or become so reconciled to it, that they actually admire a flower that is scarcely showable.

Suppose we turn to the Pansy as a proof of this. We have long since laid down as a rule,—and we defy anybody to dispute the propriety of the decision,—that the Pansy shall be round, thick, and smooth on the edge; that the field, which is the yellow, white, or straw coloured middle, shall be all of a shade; that the marking shall be uniform and distinct, and the eye shall not break into the colour: and the flowers which possess in any considerable degree these properties are highly appreciated. To go more into detail would be to limit the number of varieties; for the size of the eye, the breadth of the margin, the make of the individual petals, and many other points, constitute the changes between one variety and another, and may alter very much without touching upon the leading points; but there are those who profess to admire very large eyes and very small fields, and more than one half of the varieties go to such an extreme in this particular, that the eye breaks through to the margin, which is a desperately bad fault, and fairly destroys the claims of a Pansy to a place in a stand. It is in our opinion a very

great beauty, where the yellow or white field is large and clear, and the eye dark and without rays; but in general, the positive property of the eye not breaking through to the margin secures us against any extravagant want of field and also against a ramifying eye. We have, however, been quiet about this property a little while, and the consequence is a complete retrograde movement: more than one half the flowers in our approved stands have recently exhibited this fatal defect, and we are not quite sure that new ones coming out this very season are not remarkable for that drawback.

Amateurs must correct this themselves, by limiting their orders to such as have a clear field all round the eye, and thus put an end to a defect which literally destroys the beauty of a flower, and we may also say of a stand.

We have seen several new varieties of Mr. Thomson's, which are very attractive from the distinctness of their eyes and the clearness of the white, yellow, or straw colour; and as these will come out under the auspices of most of the dealers, there will be an improvement in the stands of the next season. Still there are other new ones coming out, defective in this particular, and the amateur can only avoid them by distinctly ordering that none be sent whose eye strikes outward through the field to the margin. We are thought to be over nice on these matters, but all we can require is that amateurs should attend to our remarks while they look at flowers, and judge for themselves; not take all we say for admitted facts, but to place side by side one Pansy with a small field and spreading eye reaching into the broad margin colour, and one with a good broad field, and an eye that is dense and does not spread out in rays, but leaves plenty of room unoccupied in the field, and they will no longer doubt for an instant the expediency of attending implicitly to our advice.

Selves are not attractive unless of novel shade and very dense in colour, all but the little yellow tube being the same shade, and nothing seen outside the yellow centre but the dense colour of the petal. The miscalled selves which exhibit a cloudy field are worthless as a run carnation. We are not to look at any thing as all perfection, but unless it approaches a little to our points, and there is at least an absence of any positive defect, they ought not to be tolerated.

In Pansies the fancy are beginning to be careless, dealers are sending out as show flowers many that are not so good as those we possess; and we are quite sure that the continuance of the manifest indifference on the part of the judges, (some of whom have of late consisted of the merest pretenders, ignorant and careless of all the essential

points,) together with an absence of the re-proof necessary to be advanced by some influential monitors, will lead to as complete a retrograde in the qualities of the Pansies cultivated by amateurs, as if we had suddenly turned back a few years. It is not the effeminate whimpering of a distant cultivator, or the impertinent intrusion of inexperienced cavillers, that recall dealers and amateurs to a consideration of what they are about. Those who want to uphold floriculture can only do it by showing the amateur what he ought to buy, and reminding him that he possesses in himself the power of checking an evil which grows insidiously, and can only be eradicated as weeds are, by employing effective and salutary measures. It is the province of a monitor to be watchful for these evils, which come up imperceptibly, and like couch-grass draw off the nourishment from the science we desire to cultivate.

The dealers have to thank us for occasionally brushing up their energies. If they are known to buy without considering all the points, we are sure they will sell without compunction; and although some amateurs of unlimited means give orders for all new and good things, and are content to find two or three in a dozen that add to their collections, there are others who cannot afford either space or money for every thing, and who therefore are obliged to do one of two things,—confine their purchases to those recommended by high authority, or wait until a thing has been out a season and then buy cheaper. Let it be perfectly understood, then, that while we acknowledge the advance made, in the general concession to us, that the field ought to be the same shade in all three under petals, and the general attention that is paid to it, we complain of the utter want of attention to the equally important property of a clear field all round the very outer rays of the eye. We are not partial to rays at all, and when we advance a little more, we may be inclined to be more strict on this point; but where the rays are moderate and well within the field, we consider them admissible, but a single ray touching the margin ought to disqualify a flower, as much as a run petal destroys a pink or a stained bottom a tulip. And if we were not to awaken people now and then to what is right, and call their attention to what is wrong, we might as well have never written the *Properties of Flowers*, or formed the Metropolitan and other Societies to carry out the principles which they inculcate.

We shall be very happy to see other and more able or more influential people take up the subject, for we have had enough of it; but, until they do, we shall never see a

carelessness or indifference to essential points, without a strenuous endeavour to correct it. There is another flower in much the same danger as the Pansy was of retrograding for want of attention, but we have said enough for the present. Let us see the effect of this advice upon the spring Pansy shows.

There is no difficulty in procuring from six to a dozen new varieties of the Pansy, with moderate sized eyes and good white, yellow, or straw coloured fields, dense margins, thick petals, moderately smooth edges, and moderately round outline; and any regular Pansy grower can serve them; but the only way to secure such varieties, is to shape the order accordingly, and distinctly forbid any of which the eye breaks through to the margin. This will effect more improvement in one year than any other means that we can devise; and although it may curtail the orders for doubtful varieties, it will greatly increase the demand for the best: because any one who wishes to show well, had better order pairs of the best than have bad ones; and such has been the disposition on the part of some writers to sacrifice the permanent interests of the trade and the amateur—for they go together, that we have seen varieties that are totally useless strongly recommended in newspapers as the best, and doubtless there will be some weak enough to act upon the recommendation, and waste their money, while the dealers will in all probability offend by executing the orders, instead of opening the eyes of the purchasers. If anybody writes to a respectable dealer for one or two or more pounds' worth of new Pansies, we strongly recommend the florist to execute the order with such varieties only as will stand the test we have applied; for he had better sell right out of good sorts and have the others on his hands, than discourage the buyer from trusting him again, by selling a single flower that will hurt his stand. We may be mistaken in our notions, but we have not often misled either the Professional or the Amateur Gardener.

VEGETATION OF BRAZIL.*

THERE is a grandeur in the vegetation of the tropics, of which we of more temperate latitudes can scarcely form a just conception. We indeed sometimes catch a faint glimpse of it in our hot-houses, but necessarily a very limited one, so that after all we must look to those who brave the perils of exploratory journeys for more complete and particular information. It is not, however, every tra-

* Travels in the Interior of Brazil, principally through the northern provinces, and the gold and diamond districts, during the years 1836—1841. By George Gardner, F.L.S., Superintendent of the Royal Botanic Gardens of Ceylon. London: Reeves. 1846.

veller who is competent to impart such information concerning exotic vegetation as is calculated to become instructive and interesting to persons who take a real interest in botanical pursuits, and more especially in the connexion of that science with the pleasures of a garden. We opened Mr. Gardner's *Travels in Brazil*, firmly imbued with this impression; but knowing Mr. Gardner to be an enthusiastic devotee of science, with a keen eye to perceive the beauties of nature, and a mind to appreciate what he saw, we did expect to find something which to ourselves, as admirers and cultivators of flowers, would prove both useful and entertaining. And we were not disappointed; neither, we think, will any one who reads Mr. Gardner's narrative in this spirit. It is real—practical—to the point; there is no false glitter; it is a plain matter-of-fact statement of what our author saw, drawn up in an understandable form, and not without elegance of diction.

Mr. Gardner was a pupil of Sir W. J. Hooker when he was botanical professor at Glasgow; and while there, having devoted much time to the study of natural history, and botany in particular, and his mind being excited by the glowing descriptions which former travellers had given of the natural productions of the tropics, he was seized with an ardent desire to travel in such regions. This enthusiasm, in the sequel, proved exceedingly useful to him, and, as he tells us, "carried him through all difficulties"—and they are neither few nor slight which spring up before the traveller in uninhabited and desert countries, "exposed at times to a burning sun, at others to torrents of rain such as are only to be witnessed within the tropics, separated for years from all civilized society, sleeping for months together in the open air in all seasons, surrounded by beasts of prey and hordes of more savage Indians, often obliged to carry a supply of water on horseback over desert tracts, and not unfrequently passing two or three days without tasting solid food." These difficulties, Mr. Gardner tells us, have been repaid by the pleasure which such wanderings always afford to the lover of nature. Mr. Gardner is now Director of the Botanic Garden at Ceylon; and his narrative under notice was principally compiled during his voyage from England thither.

About two months after his embarkation on the 20th of May 1836, Mr. Gardner first set foot on the shores of the great continent of the new world, at Rio de Janeiro. We must pass over his interesting account of the place and people, and come at once to that part of the narrative which accords with the heading to this notice. Soon after his arrival at Rio, Mr. Gardner tells us, he made the acquaint-

ance and gained the friendship of a family that had already travelled in distant parts of South America, and who were devoted to pursuits similar to his own; in their company he made many excursions in the vicinities of Rio:—

"In order to present some general idea of the splendid scenery of the country, and the leading features of this part of Brazil, I will give an account of some of these excursions. There is a path by the side of the great aqueduct, which has always been the favourite resort of naturalists who have visited Rio; and there is certainly no walk near the city so fruitful either in insects or plants. The following notes were made on the return from my first visit along the whole length of the aqueduct. After reaching the head of the Laranjeiras valley, which is about two miles in extent, the ascent becomes rather steep. At this time it was about nine A.M., and the rays of the sun, proceeding from a cloudless sky, were very powerful; but a short distance brought us within the cool shade of the dense forest which skirts the sides of the Corcovado, and through which our path lay. In the valley we saw some very large trees of a thorny-stemmed *Bombax*, but they were then destitute both of leaves and flowers, nearly all the trees of this tribe being deciduous. There we also passed under the shade of a very large solitary tree which overhangs the road, and is well known by the name of the Pao Grande. It is the *Jequetiba* of the Brazilians, and the *Couratari legalis* of Martius. Considerably further up, and on the banks of a small stream that descends from the mountain, we found several curious *Dorstenias*, and many delicate species of ferns. We also added here to our collections fine specimens of the tree-fern (*Trichopteris excelsa*), which was the first of the kind I had yet seen. The forests here exhibited all the characteristics of tropical vegetation. The rich black soil, which has been forming for centuries in the broad ravines from the decay of leaves, &c., is covered with herbaceous ferns, *Dorstenias*, *Heliconias*, *Begonias*, and other plants which love shade and humidity; while above these rise the tall and graceful tree-ferns, and the noble palms, the large leaves of which tremble in the slightest breeze. But it is the gigantic forest trees themselves which produce the strongest impression on the mind of a stranger. How I felt the truth of the observation of Humboldt, that, when a traveller newly arrived from Europe penetrates for the first time into the forests of South America, nature presents itself to him under such an unexpected aspect that he can scarcely distinguish what most excites his admiration, the deep silence

of those solitudes, the individual beauty and contrast of forms, or that vigour and freshness of vegetable life which characterize the climate of the tropics. What first claims attention is the great size of the trees, their thickness, and the height to which they rear their unbranched stems. Then, in place of the few mosses and lichens which cover the trunks and boughs of the forest trees of temperate climes, here they are bearded from the roots to the very extremities of the smallest branches, with ferns, *Aroidæ*, *Tillandsias*, *Cacti*, *Orchideæ*, *Gesneriæ*, and other epiphytous plants. Besides these, many of the large trunks are encircled with the twining stems of *Bignonias*, and shrubs of similar habit, the branches of which frequently become thick, and compress the tree so much, that it perishes in the too close embrace. Those climbers, again, which merely ascend the trunk, supporting themselves by their numerous small roots, often become detached after reaching the boughs, and where many of them exist, the stem presents the aspect of a large mast supported by its stays. These rope-like twiners and creeping plants, passing from tree to tree, descending from the branches to the ground, and ascending again to other boughs, intermingle themselves in a thousand ways, and render a passage through such parts of the forest both difficult and annoying.

"Having reached by mid-day the level on which the water of the aqueduct is brought from its source, we continued our walk along it for upwards of two miles. Our progress, however, was slow, from the number of new objects continually claiming our attention. In damp shady spots by the side of the aqueduct we found the common water-cress (*Nasturtium officinale*) of Europe, which is one of the few plants that is truly cosmopolite; and on the rocks grew some little European mosses, which, being old acquaintances, recalled pleasing thoughts of home. Numerous ferns, and many strange-leaved *Begonias* grew along the side of the little stream. While collecting specimens of a moss, I had a providential escape from a poisonous snake; I caught it in my hand along with a handful of the moss, which was soon dropped when I perceived what accompanied it. Venomous snakes are not uncommon in the province of Rio de Janeiro; but accidents do not so often result from them as might be supposed."

"The Corcovado mountain offers a rich field to the botanist. I frequently visited the lower portions, but only once ascended to the summit. The ascent is from the N.W. side, and although rather steep in some places, may be ridden on horseback all the way up. Some of the trees on the lower parts of it are

very large. The thick underwood consists of *Palms*, *Melastomaceæ*, *Myrtaceæ*, *Tree-ferns*, *Crotons*, &c.; and beneath these are many delicate herbaceous ferns, *Dorstenias*, *Heliconias*, and, in the more open places, a few large grasses. Towards the summit the trees are of much smaller growth, and shrubs belonging to the genus *Croton* are abundant, as well as a small kind of bamboo. The summit itself is a large mass of very coarse-grained granite. In the clefts of the rocks grow a few small kinds of Orchideous plants, and a beautiful tuberous-rooted scarlet-flowered *Gesnera*. From this point a magnificent panoramic view of the bay, the city, and the surrounding country is obtained."—Pp. 23—25, 27, 28.

About fifteen miles from the city rises the Gavea or Topsail Mountain,

"Among the loose rocks at the foot of the mountain we made a fine collection of beautiful land shells, and on the rocks by the sea shore we found the beautiful *Gloxinia speciosa*, which is now so common in the hot-houses of England, growing in the greatest profusion, and covered with flowers. Along with it grows a kind of wild parsley, and, twining among the bushes, a new kind of Indian cress (*Tropæolum orthoceras* Gardn.). On the face of the mountain, at an elevation of several hundred feet, we observed some patches of one of those beautiful large-flowered orchideous plants which are so common in Brazil. Its large rose-coloured flowers were very conspicuous, but we could not reach them. A few days afterwards we found it on a neighbouring mountain, and ascertained it to be *Cattleya labiata*. Those on the Gavea will long continue to vegetate, far from the reach of the greedy collector."—Pp. 28, 29.

Immediately opposite the Gavea is a mountain called the Pedra Bonita. On one excursion to this mountain—

"A great part of the top we found to be covered with the beautiful lily-like *Vellozia candida*, on the branches of which grew a pretty *Epidendrum*, with rose-coloured flowers. Along with the *Vellozia* grew two beautiful subsaculent species of *Echites*, one with large dark violet-coloured flowers, the other with white ones of a similar size. They both exhale an odour not unlike that of the common primrose, but more powerful. On the edge of a precipice on the eastern side, we found, covered with its large rose-coloured flowers, the splendid *Cattleya labiata* which a few days before we had seen on the Gavea."

"Other excursions to the islands in the bay, and to Jurujuba, on the opposite side of it, were also productive of many interesting

species of plants. It was at the latter place, on dry bushy hills, that I first saw the really beautiful *Buginvillea spectabilis* growing wild. It climbs up into the tops of the bushes and trees near which it grows, and the brilliant colour of the flowers, which it produces in the greatest profusion, renders it conspicuous in the woods at a great distance. This, as well as the equally beautiful *Bignonia venusta*, are much cultivated as ornamental climbers in the suburbs."—Pp. 33, 34.

From the Organ Mountains many beautiful plants have already reached our gardens, and we may look for others. Mr. Gardner thus describes the first 3,000 feet of ascent :—

"The whole length of the road is through one dense forest, the magnificence of which cannot be imagined by those who have never seen it, nor penetrated into its recesses. Those remnants of the virgin forest which still stand in the vicinity of the capital, although they appear grand to the eye of a newly-arrived European, become insignificant when compared with the mass of giant vegetation which clothes the sides of the Organ Mountains. So far as I have been able to determine, the large forest trees consist of various species of *Palms*, *Laurus*, *Ficus*, *Cassia*, *Bignonia*, *Solanum*, *Myrtaceæ*, and *Melastomaceæ*. In temperate climates natural forests are mostly composed of trees which grow gregariously. In those of tropical countries it is seldom that two trees of a kind are to be seen growing together, the variety of different species is so great. Many of the trees are of immense size, and have their trunks and branches covered with myriads of those plants which are usually called parasites, but are not so in reality, consisting of *Orchideæ*, *Bromeliaceæ*, *Ferns*, *Peperomia*, &c., which derive their nourishment from the moisture of their bark, and the earthy matter which has been formed from the decay of mosses, &c. Many of the trees have their trunks encircled by twiners, the stems of which are often thicker than those they surround. This is particularly the case with a kind of wild fig, called by the Brazilians, *Cipo Matador*. It runs up the tree to which it has attached itself, and at the distance of about every ten feet throws out from each side a thick clasper, which curves round, and closely entwines the other stem. As both the trees increase in size, the pressure ultimately becomes so great, that the supporting one dies from the embrace of the parasite.

"There is another kind of wild fig-tree, with an enormous height and thickness of stem, to which the English residents give the name of Buttress-tree, from several large thin plates which stand out from the bottom of the

trunk. They begin to jut out from the stem at the height of ten or twelve feet from the bottom, and gradually increase in breadth till they reach the ground, where they are connected with the large roots of the tree. At the surface of the ground these plates are often five feet broad, and throughout not more than a few inches thick. The various species of *Laurus* form fine trees; they flower in the months of April and May, at which season the atmosphere is loaded with the rich perfume of their small white blossoms. When their fruit is ripe, it forms the principal food of the Jacutinga (*Penelope Jacutinga*, Spix), a fine large game bird. The large *Cassia* have a striking appearance when in flower; and, as an almost equal number of large trees of *Lasiandra Fontanesiana*, and others of the *Melastoma* tribe, are in bloom at the same time, the forests are then almost one mass of yellow and purple from the abundance of these flowers. Rising amid these, the pink-coloured flowers of the *Chorisia speciosa*—a kind of silk cotton-tree—can be easily distinguished. It is also a large tree, with a stem covered with strong prickles, from five to eight feet in circumference, unbranched to the height of thirty or forty feet. The branches then form a nearly hemispherical top, which, when covered with its thousands of beautiful large rose-coloured blossoms, has a striking effect when contrasted with the masses of green, yellow, and purple of the surrounding trees.

"Many of these large trunks afford support to various species of climbing and twining shrubs, belonging to the natural orders *Bignoniaceæ*, *Compositæ*, *Apocynæ*, and *Leguminosæ*, the stems of which frequently assume a very remarkable appearance. Several of them are often twisted together and dangle from the branches of the trees, like large ropes, while others are flat and compressed, like belts: of the latter description I have met with some six inches broad, and not more than an inch thick. Two of the finest climbers are the beautiful large trumpet-flowered *Solanandra grandiflora*, which, diffusing itself among the largest trees of the forest, gives them a magnificence not their own; and a showy species of *Fuchsia* (*F. integrifolia*, Cambess.), which is very common, attaching itself to all kinds of trees, often reaching to the height of from sixty to one hundred feet, and then falling down in the most beautiful festoons.

"At the foot of the mountains the under-wood principally consists of shrubs belonging to the natural orders *Melastomaceæ*, *Myrtaceæ*, *Compositæ*, *Solanaceæ*, and *Rubiaceæ*, among which are many large species of herbaceous ferns, and a few palms. About the

middle, palms and tree-ferns abound, some of the latter reaching to a height of not less than forty feet. These trees are so unlike every other denizen of the forest, so strange in appearance, yet so graceful, that they have always attracted my attention more than any other, not even excepting the palms. At an elevation of about 2,000 feet, a large species of bamboo (*Bambusa Tagoara*, Mart.), makes its appearance. The stems of this gigantic grass are often eighteen inches in circumference, and attain a height of from fifty to one hundred feet. They do not, however, grow perfectly upright, their tops forming a graceful curve downwards. Throughout the whole distance, the path was lined on each side with the most beautiful herbaceous plants, and delicate ferns."—Pp. 42—46.

The Organ Mountains rise 4,000 feet higher than this; and as much of this tract had never been visited by a botanist, Mr. Gardner was anxious to explore a field that promised so much novelty. We may quote the details of his progress:—

"We entered the forest at about a mile to the north of Mr. March's house, and our road for that day was nearly due west. Two years before, an English merchant from Rio ascended, from mere curiosity, to within a few hundred feet of the summit, guided by the same old black who accompanied me. For the first few miles we were able to keep the road which he had made, but, from the rapid growth of the bamboos and underwood through which it had been cut, it was as difficult to force our way as if no path had ever been made. Our progress was but slow, it being necessary for one of the blacks to go on before in order to cut a pass. Some of the bamboos were of immense size; I measured several about six inches in diameter, and their height could not be less than eighty or a hundred feet. The internodes are generally filled with water, obviously secreted by the plant itself. Prince Maximilian, in his travels, speaks of this fluid as forming a most delicious beverage to hunters and others in the woods. I have frequently tasted it, but always found it so nauseous that the most urgent thirst alone would compel me to drink it.

"Near the entrance of the wood we passed a large species of *Copaifera*, the lower part of the stem of which had been pierced for the purpose of obtaining the balsam which those trees exude. For miles our route lay nearly parallel with a small river, along the banks of which grew some very large trees; among them I observed a species of *Laurus*, and another of *Pleroma*, both in flower. The underwood consisted of a great variety of shrubby *Melastomaceæ*, *Myrtaceæ*, *Rubi-*

aceæ, and suffruticose species of *Begonia*. In other places elegant tree-ferns abounded, their stems often covered with little delicate species of the same tribe, or air-plants bearing beautiful flowers. Pretty herbaceous ferns and handsome-flowered *Begonias* were trodden down at every footstep. The stems of the large trees were covered with *Bromelias*, *Tillandsias*, *Orchideæ*, ferns, and a climbing species of *Begonia*. Occasionally a large plant of *Cactus truncatus* was to be seen hanging from rocks or from the stem of some large tree, covered with hundreds of beautiful pink blossoms. In crossing over a hill about five hundred feet high, which stands in the valley we were now passing through, I found the top of it literally covered with various kinds of Orchidaceous plants, but with the exception of the beautiful little *Sophronites grandiflora*, which was then in flower, all had been previously met with at a lower elevation. It was here likewise that I first met with *Luxemburgia ciliosa*, a fine shrub producing large corymbs of lemon-coloured flowers, and belonging to the violet tribe. On this hill I likewise observed two kinds of bamboo, different from the large kinds in the woods below. One of them had the internodes considerably shorter in proportion to the size of the plant, and was altogether much smaller. The other species was still less, its stem not being more than half an inch in diameter, but continuing of that thickness to a height of fifteen or twenty feet. The getting through these was the most difficult part of our day's journey. At four o'clock, P.M., we reached a place by the side of a small stream, where I determined to remain for the night; and, while the blacks were occupied in cutting wood for a fire and in preparing dinner, I took a walk up the course of the little stream. As I estimated this spot to be at an elevation of about 4,500 feet, I naturally expected a vegetation different from that in the valley below. The first plant that attracted my attention was what I imagined to be a fine individual of *Cereus truncatus*, in full flower, hanging from the under-side of the trunk of a large tree that was bent over the stream, but on getting possession of it, it proved to be a new, and, perhaps, a still more beautiful species. I have named it *Cereus Russellianus*, in honour of His Grace the late Duke of Bedford, one of the most liberal supporters of my mission to Brazil; it has since been introduced to the hot-houses of England. A little way further up the stream, by the side of a small waterfall, and on a slanting bank near it, grew great abundance of a fine dark red-flowered *Amaryllis*. This spot is one of the most charming I have ever seen. The bed of the stream is about ten feet broad, but it is only during heavy rains

that the water covers this space ; at this time the stream was little more than perceptible. The water falls over three successive shelves of granite, each about eight feet high, the faces of which are covered with mosses. Along the stream at the bottom of the fall there are several middle-sized trees, the branches of which are festooned with the long branches of a *Fuchsia*, loaded with splendid crimson flowers. By the side of the fall there are several bushes of a large flowered *Pleroma*, and, along with them, a few of a red-blossomed *Esterhazyia*, and a broad thick-leaved species of *Clusia* (*C. fragrans*, Gard.), loading the atmosphere with a delightful odour arising from its large white blossoms ; beneath these grow the *Amaryllis*, an *Eryngium*, several *Tillandsias* and many *Ferns*. Having gained the upper part of the fall, I found a space, extending to a considerable distance on each side and for some way up the mountain, destitute of trees—nothing but bare portions of rock, with occasional masses of low shrubs and herbaceous plants. Among the *Orchideæ*, the beautiful *Zygopetalon Machaii*, and the odoriferous *Maxillaria picta*, were not the least common. Darkness now beginning to set in, I returned to the encampment, where I found a large fire lighted ; the evening was so fine that I considered the erection of a hut unnecessary, and lay down about eight, P.M., on a few palm leaves by the fire, with my Poncho round me, to pass the night.

"When I arose next morning at day-break, I found the thermometer at 46°. While breakfast was preparing I again went out to botanize, but added little more than a few *Ferns* to my collection of the previous evening. Our journey to the place where we slept was of very gradual ascent ; we had now to commence the *ascent proper* of the peaks. . . . After half an hour's hard work, we reached a comparatively flat wooded spot. On the steep part I collected, in moist places, an *Eriocaulon*, a small *Sun-dew*, and a new genus belonging to the *Gentian* tribe ; among these grew also the curious *Burmannia bicolor*. In passing through the wood above mentioned, I saw plenty of my new *Cactus* growing on the stems of the larger trees, whilst the rocks were covered with *Gesneras*, and different kinds of *Orchidaceous* plants. Emerging from the wood we encountered another steep rocky place, almost entirely covered with a large pine-apple-like *Tillandsia*, above which rose a few plants of a fine large scarlet-flowered shrubby *Salvia* (*S. Benthamiana*, Gardn.), and a pale blossomed *Virgularia* ; on a nearly bare portion of the rock grew several patches of a large herbaceous plant, belonging to the tribe of the *Gentians* ; it grows from a foot to two feet high, with

thick succulent glaucous leaves, the upper ones connate, and from out of which proceed about half a dozen pedicels, each bearing a single large flower, the calyx of which is much inflated and tinged with purple ; it is the *Prepusa connata*, Gardn. The only previously known species was found by Martius, on a large mountain range between the Diamond country and Bahia ; a third was afterwards discovered on the very summit of the Organ Mountains. Passing this place we again entered a wooded tract, where we found many Tapir paths, as we had also done the day previous in the woods through which we passed, which rendered our progress much quicker than it otherwise would have been, as the branches above only require to be cut away to make a good road. Judging from the abundance of the tracts which we here met with, the Tapir must be a very common animal in this remote and solitary part of the mountains ; here they are as yet out of the reach of the hunter, who commits great havoc among those which inhabit the lower woods, and there is also abundance of herbage to supply them with food. In passing through this wood, one of the blacks shot a *Jacutinga* (*Penelope Jacutinga*, Spix), and I collected specimens of a few *Orchideous* plants, and a large yellow-flowered *Senecio*.

"Leaving the wood, we came upon a slanting *Sphagnum* bog, in which grew some very alpine-looking shrubs ; these consisted chiefly of a *Proteaceous*-like *Baccharis*, a *Vaccinium*, an *Andromeda*, the *Lavosierra imbricata*, remarkable for its large flowers and small leaves, and a *Pleroma* ; among the moss, an *Eriocaulon*, and a handsome *Utricularia*, with large cordate leaves and purple flowers, grew in the greatest profusion. Judging from the top of the mountain, we were now at an elevation of nearly 6,000 feet. Leaving it, we commenced a very steep ascent covered principally with low shrubs ; we continued our way for about an hour through this stunted vegetation, making but slow progress, although we were much facilitated by having the path of the Tapir to crawl up. By following this track we reached a point from which a beautiful prospect of the low country is obtained, particularly to the eastward, where, as far as the eye could reach, it was one mass of conical shaped hills, only one ridge rising to any considerable height above the rest ; the point we had attained was the summit of one of the many peaks which form the upper range of the Organ Mountains. At about a quarter of a mile distant stood what I then believed to be the highest peak, and certainly not more than three or four hundred feet above us ; but between the two peaks lay a deep densely-wooded ravine. It being now past two o'clock

in the afternoon, it was too late to think of ascending it that day, so I determined to remain where we were for the night, and attempt it next day; but the blacks refused to do so, on account of no water being nearer than a little above where we had slept the previous night; as I could not force them to remain, I was, much against my will, obliged to abandon all idea of reaching the summit at this time. The summit of the peak on which we now were, was quite a little flower garden; a pretty *Fuchsia*, in full flower, was trailing over the bare rocks, in their clefts grew a handsome *Amaryllis*, and on all sides numerous flowering shrubs. The coolness of the air and the stillness were quite refreshing; not a sound was to be heard; and the only animals to be seen were a few small birds, so tame that they allowed us to come quite close to them. After partaking of a slight repast we commenced our downward journey, and reached our encampment just as night was setting in."—Pp. 63—69.

Four years afterwards these mountains were again visited, on returning from a journey through the interior of the country, and this visit is thus described:—

"Following the path I had made four years before, we reached, about four o'clock, the highest point I had attained on my former visit, and at this place, under the ledge of a rock, we slept for the night; this being a very convenient, and well-sheltered spot, we decided to make it our head quarters during the few days we remained in the mountains. Besides specimens of nearly all the plants which I found on my previous journey, I collected on the ascent many that were new to me; two of the most remarkable of these were a kind of *Fuchsia* (*F. alpestris*, Gardn.), and a very extraordinary species of *Utricularia*; the latter, to which I have given the name of *U. nelumbifolia*, has since been published in Hooker's *Icones Plantarum*, where a very excellent figure of it is given; like most of its congeners, it is aquatic, but what is most curious is, that it is only to be found growing in the water which collects in the bottom of the leaves of a large *Tillandsia*, that inhabits abundantly an arid rocky part of the mountain, at an elevation of about 5,000 feet above the level of the sea. Besides the ordinary method by seed, it propagates itself by runners, which it throws out from the base of the flower stem; this runner is always found directing itself towards the nearest *Tillandsia*, when it inserts its point into the water, and gives origin to a new plant, which, in its turn, sends out another shoot; in this manner I have seen not less than six plants united. The

leaves, which are peltate, measure upwards of three inches across; and the flowering stem, which is upwards of two feet long, bears numerous large purple flowers.

"On the following morning, after an early breakfast, we set out to ascend that part of the Serra, which appears [from Mr. March's Fazenda] to be the highest; this peak, which I had been prevented from ascending in 1837, was reached in the following year by the Rev. Mr. Maister, who was then the English clergyman at Rio; and again, about six weeks before our visit, by Mr. Lobb, an English gardener, who had been sent out by a nurseryman to collect seeds and living plants: we thus found a path made ready for us. This part of the mountain is about 600 feet higher than the spot we had chosen for our bivouac. Starting then from this place, we made a descent into a wooded ravine, in which the ground was covered by the beautiful *Alströmeria nemorosa*, and many delicate ferns, while the branches of the *Melastomaceæ*, and other trees and shrubs, were festooned with the climbing *Fuchsia*, brilliant with its rich scarlet blossoms. Then ascending for some time, through a well wooded tract, we entered upon a steeper portion of the mountain, over-spread with beautiful flowering shrubs, among which were several fine *Melastomaceæ*, fruticose *Compositæ*, a *Gualtheria*, some species of *Vaccinium*, and a handsome new *Escallonia* (*E. organensis*, Gardn.), bearing a profusion of rose-coloured blossoms. The summit of this peak we found to consist of several enormous loose blocks of granite, covered with *Lichens*, small species of *Orchidææ*, *Genereæ*, and where there was any accumulation of soil, a large-flowered *Amaryllis* (*Hippeastrum organensis*), now common in English hot-houses; the climbing *Fuchsia* in a dwarf procumbent state was also found here. . . . The day was beautifully clear, and we had a splendid view of the surrounding country. On looking to the westward, however, it was evident that we were not on the most elevated point of the range, as we observed, about a mile distant, a broadly rounded peak, considerably higher; and we accordingly determined to ascend it on the following day. I here met with two very interesting plants, one a beautiful tree-fern, which proved to be the *Hemitelia capensis*, a native of the Cape of Good Hope, which is a remarkable fact in the geographical distribution of plants, as tree-ferns have a very limited range; the other was a very handsome herbaceous plant, about four feet high, with a woolly stem, and large leaves, not unlike those of a *Verbascum*, exhibiting large panicles of orange coloured flowers; it belonged to the natural order *Compositæ*, and as it proved to be a new

genus, I named it after my late lamented friend, J. E. Bowman, Esq., of Manchester.

"Early on the following day, we started to ascend the loftiest peak of the mountain, before noticed, and found it to be a more fatiguing journey than that of the previous day, in consequence of having to cut our way through two or three wooded tracts, of considerable breadth; the paths of the Tapir, however, frequently facilitated our progress. Very shortly after we started, we were agreeably surprised to find, in the lower part of the valley we had to cross, a beautiful little stream of cool and limpid water, descending from the more elevated parts of the mountain, and flowing towards the east. . . . This valley is somewhat less than a quarter of a mile square, and is covered on both sides of the stream, but particularly on the west, with virgin forests, the trees of which are of considerable size, one of the largest being a species of *Weinmannia*. The soil appears to be of excellent quality, there being a good depth of alluvial matter. . . . Passing over a hill that bounds the western side of this valley, we came upon an open flat marshy tract, the greater part of which is covered with a tall coarse grass, about five feet high, growing in tufts. Leaving this, we entered another wooded spot, formed of trees of a much larger size than those before observed, and passed through it along the tracks of the Tapir, where I was rather surprised to observe that while the stem and branches of almost every tree were covered with the beautiful little *Sophrontitis grandiflora*, no other orchideous plant was to be seen; beyond this, we met with no more wood; the vegetation consisting of various herbaceous plants, and a few stunted shrubs. From the wooded region, the summit of the mountain is gained by a steep acclivity, on one side of which is a broad ravine, full of immense blocks of granite.

"The summit of this peak we found to be very different from that we visited the day before, consisting of one great mass of granite flat on its surface, and of considerable extent; the rock is, for the most part, bare, but some portions of the western side were covered with a vegetation of stunted shrubs, and herbaceous plants; among the latter, the most abundant was the pretty *Prepusa Hookeriana*, the large inflated calyces of which resemble those of some species of catchfly; on the very summit were seen many little excavations in the rock, full of excellent water, and had we been aware of this, it would have saved us the trouble of carrying with us a supply in bottles. The day was very fine, but a broad belt of clouds that spread around the mountain, below us, prevented us from enjoying the extensive view on which we had fully cal-

culated. At mid-day, the thermometer indicated a temperature of 64° in the shade, and I found that water boiled at a heat of 198°, from which I estimate the height of the mountain, above the level of the sea, to be 7,800 feet. A register of the thermometer, kept during our stay on the upper regions of the Serra, and another observed on the level of Mr. March's Fazenda [3,100 feet] gave a mean difference of temperature between the two places, of 12.5 degrees. Baron Humboldt estimates the mean decrement of heat within the tropics, at 1° for every 344 feet of elevation, and considers this ratio as uniform up to the height of 8,000 feet, beyond which it is reduced to three-fifths of that quantity, as far as the elevation of 20,000 feet; it has, however, been since found, that in general, the effect of elevation above the level of the sea, in diminishing temperature, is, in all latitudes, nearly in proportion to the height, the decrement being 1° of heat for every 352 feet of altitude; this would give 4,400 feet for the elevation of the highest peak of the Organ Mountains, above Mr. March's Fazenda, and as this is 3,100 feet above the level of the sea, we have for the total greatest elevation, 7,500 feet. We returned to our former resting-place in the evening, well pleased with our day's excursion."—Pp. 527—532.

We must here close our notice of this very interesting volume, the extracts from which, however, may be taken as a fair sample of the general character of the work, and will convey a better idea of its value than any compliment from us. We may possibly return to it.

GARDENING MEMORANDA FOR MARCH.*

THIS is a great season for grafting, and there is scarcely an operation that is more important in any kind of view. It should be commenced at the beginning of the month. Now we begin gardening in earnest; sowing becomes general, weeding, stirring the surface between the crops, earthing up, double vigilance in the flower garden, where the borders may want regulation, many hardy annuals sowing, and perennials planting out. Tulip beds and forward ranunculus beds want more than ordinary attention as to covering. Pink and pansy beds want top dressing, and the surface gently stirred to mix in the dressing. After frosts all the plants require looking to, and the earth settled about their roots. Planting trees and shrubs should be brought to a finish. Pruning of all sorts should be completed, and wall trees nailed where the branches happen to have become loose. All

* A very elaborate and complete Calendar of Gardening Operations for March is published in No. 27 of the Horticultural Magazine.

the alterations uncompleted should be at once completed. Choice shrubs not layered in autumn should be now layered, if at all; that is, any lower branches not wanted for the beauty of the tree may be slit a little, at a joint, in the most convenient part, and be pegged down under ground; at the end of the year they will be rooted, and may be cut off, and planted where they are required, or in a nursery bed to grow stronger. By this means a stock may be had of all the choice things in a place. Worked roses want looking to, on account of the suckers which spring up and make rapid progress, if not taken off directly, and so prevented from running away with the strength of the plant, which ought to have all of it. All awkwardly grown shrubs ought to be shaped a little before they make their spring growth. All the branches which grow straggling should be shortened or entirely removed; bare places may be assisted in appearance by tying branches nearer together. All the borders and clumps should be dug as soon as the rising bulbs, perennials, and herbaceous plants show themselves, so that they be not damaged in the operation. The beds of tulips should be stirred on the surface, and lumps crushed, that the earth may set close to the plants, and the ordinary operations of gardening may be said to commence in earnest. Stoves, greenhouses, and other places of protection for plants require much the same attention as before, only that there is not so

much likelihood of severe long frosts, and the weather is generally softening a little. Forcing houses must be well attended to, and the heat be kept uniform; cleanliness in the stove must above all things be looked to, and any thing tending to mischief be instantly disturbed. The destruction of vermin at the right time is especially the gardener's duty. Every butterfly that can be destroyed prevents hundreds of grubs being deposited on something; every wasp that can be killed destroys a whole nest; and those who cultivate the flowers that earwigs delight in should spare no pains to trap and kill even a solitary victim. Dahlia seed should be sown this month.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING MARCH.

The Greenhouse.—From forty-five to fifty-five degrees by day, and thirty-five to forty-five degrees by night.

The Conservatory.—From fifty-five to sixty-five degrees by day, and about forty-five degrees by night.

The Plant-Stove.—From seventy to eighty degrees by day, and sixty to seventy degrees by night.

The Orchid House.—The warm or Indian house, eighty degrees by day, and seventy degrees by night; the cool or Mexican house, seventy-five degrees by day, and sixty to sixty-five degrees by night.

NEGLECTED PLANTS.

THE MYRTLE.

NOVELTY has great charms; hence new plants of very little merit bring large prices, and have their day, while the most beautiful subjects, which have become common, are thrown by, neglected and despised. There is not, for instance, in all the exotics that were ever introduced, a more beautiful plant than the myrtle. It possesses every point that constitutes perfection, and were we judges where real merit had to decide, instead of the many under-currents which too often influence the decisions, we should esteem a well-grown myrtle far more than one-half the plants which are shown because of their comparative scarcity; and if skill and taste were allowed to govern instead of novelty, many other neglected subjects would be especial favourites. The Myrtle is a plant of beautiful habit, bright evergreen foliage, and pure white handsome blossoms fully as abundant as is desirable, equally distributed over the plant. It is a plant requiring some little care, but scarcely any skill. No training or pruning can improve its natural

growth. Whether one year old or twenty, the health, appearance, and bloom are unimpaired if the ordinary wants of soil and moisture be supplied. It increases by cuttings, which will freely strike root even without covering, and it will grow in the most ordinary soil. The skilful but often inconsiderate gardener does not grow the plant so well as the humble cottager, for while the latter gives the soil too poor, the former, who has been lauded by some public writers for rapid growth, and his skill measured by the size he can grow a thing, too often grows a subject so fast as to destroy the natural habit of the plant by elongating the joints and making the foliage comparatively scanty. The soil in which the Myrtle will grow best is, half the loam formed of rotted turves, which of course contains a good deal of vegetable mould, and half turfy peat, such as used for heaths. The cutting may be any short branch, two inches long, torn or slipped off at the base. This may be stuck in the middle of a small pot, and to facilitate the striking it may

be covered with a broken wine glass, and placed in the window of the dwelling-house; or cuttings may be taken from any part of a plant, and be cut up to a joint, leaving it two inches long; but all cuttings should be ends of shoots, to obtain the natural growth of the plant. The lower end of the cutting should be stripped of the leaves, and put about one inch into the soil. The glassing of the cuttings makes them strike root sooner; bottom heat will make a still greater difference, but it is quite sufficient to use merely a glass over them. Keep them moist, and shade them with paper over the glass from the full heat of the sun. If many cuttings are struck in a pot, they may be put out into small-sized pots as soon as they are rooted. In these small pots they may grow until their roots reach the sides and begin to mat across each other; they should then be shifted into pots a size larger, and be grown out of doors in summer time, in doors, with plenty of air, in winter time. Where they are grown in any quantity, the best position for them is a cold pit in a shady situation, or otherwise the mid-day hour of sunshine should be kept off in the very hot months. In this soil, with constant care as to the watering, the growth will be bushy, pyramidal, and of good colour; the only danger will be in neglecting to shift and water as often as required, and not oftener. The narrow-leaved, broad-leaved, single, and double, are equally handsome in growth, and unless they are starved by neglect, they will not lose their very lowest leaves. If instead of the natural growth a very bushy and dwarf habit be wanted, the cutting should be topped as soon as it begins to grow, and when the side branches have made some growth these may be topped also; and all through the growth, any shoots that are too vigorous for the rest of the plant must be shortened. Nobody should be without a pair of myrtles, or three, one of each kind, for they are unquestionably among the very best of the greenhouse tribes of plants.

THE NERIUM OLEANDER.

Go into the greenhouses of many establishments, and there will be found some long, bare-legged, straggling plants of the *Nerium Oleander*, like a bundle of sticks, with in due season green leaves at top, and perchance a few half-developed blooms at the summit; and yet there is hardly a more showy, graceful, or elegant plant when grown as it ought to be. The other plants may be equally neglected; there may be *Camellias*, *Banksias*, *Acacias*, and others nearly as bad; but they will all exist if the frost be not allowed to kill them, and all make an effort every season to grow and bloom. But the *Nerium Oleander* wants a little care,

and seldom has it. Hundreds who have seen them at market, bought them, stuck them in the greenhouse, saw them the next year make a show of buds which never half opened,—but there was a mistake in the management. The *Oleander* will not grow and bloom properly in a common greenhouse; it wants care at particular seasons. It should be kept growing until it flowers, and when it has done flowering is the time for resting. It is no more difficult to grow than a common geranium, but it must be done seasonably, and it should be remembered that it wants warmth and shade to bring out the flowers. Let us begin at the beginning.

CUTTINGS, STRIKING, AND POTTING OFF.

Take off the tops of branches that have not bloomed, three inches long; cut them off at a joint, or after they are off cut the bottoms up to a joint. Fill a pot with the proper crocks for draining at bottom, and good loam, dung, and peat earth, all but an inch of the top. Strike the potting table two or three times with the bottom of the pot, to settle the earth down a little, and level it so that there may be just an inch to fill up with silver sand. Strip the leaves from the lower end of the cuttings, so as to bare an inch of the wood. Water the sand and earth very gently, that it may not be disturbed by the operation, and stick the cuttings in within half an inch of each other, but leaving room all round to put on a bell glass, so that the edge may go into the sand and exclude the air; when they are put in, water again very gently to settle the sand to the stems. Cover with the bell glass, and place them in a propagating house with gentle bottom heat or a mild hot-bed of tan or leaves, or for want of better accommodation, in a cucumber or melon bed that has pretty much declined in heat. Wipe the glasses every morning, and shade them from the direct rays or burning heat of the sun by means of a paper or thin cloth over the glass. In a few weeks they will have struck root and begun to grow. When they have well rooted, get large sized 60 pots, (for there are two kinds made,) and very carefully remove the cuttings that have struck into these pots. They will require to be first well drained with crocks, and then filled within a little of the top edge, holding the struck cutting upright in the centre of the pot, which is then to be filled in and gently pressed on the root, and adjusted so that the pot may be all but full, just enough room remaining between the soil and the edge of the pot to hold a little water when they require to be refreshed. These may be placed where they come from, whether it be the propagating-house, hot-bed, or stove, but should have the bottom heat a few days, until they are fairly established in their new pots.

GENERAL MANAGEMENT.

When they have fairly started and begun to grow, one half may have their tops nipped out to promote side shoots. The object is to keep some in their natural growth, and to make the others bushy. In the further progress of these plants, watch the occasion for re-potting into larger sized vessels, and check any of the branches that grow out of place, or too vigorous for the rest of the plant. Keep them in a house above the ordinary temperature of a greenhouse during the winter, and when they show buds at the ends of the branches, turn out the balls to see the state of the roots. If they touch the sides of the pot, give them one good shift into those of a larger size, and keep them going on till they bloom, which they will in fine order, if well tended and watered as they want it, and if they do not receive any check from wind or cold. When they have done flowering, keep them much more dry, and if in summer time, they may be turned out of doors where they are, or can be protected from the heat of the sun and too much wet. They may now be pruned, that is, so cut as to secure a handsome shape by the next season's growth, for upon taste in pruning entirely depends the fine or other form they assume. When the fresh growth commences, take off any shoots that come in places where they are not wanted, that all the strength may be given to the general plant. They may now make their growth out of doors until the rest of the summer months are gone, when they must be removed to the greenhouse with other plants, or may be placed in a pit without heat, provided they are always well covered up from frost and cold winds. The danger of a check that will blight all the buds, or at least stunt them, is when they first show; a frost would fairly set them, so that they would not open at all. Be therefore doubly careful from that instant. The removal of them at that time to a warm greenhouse not liable to changes, or to a moderately heated forcing house, should be attended to, but before they are placed in the house they should be shifted carefully, and from that time be well watered, and receive no check.

MANAGEMENT OF OLD AND UGLY PLANTS.

The only chance of making old straggling plants at all shapely would be a little dependent on the present form. If they can be cut into any form at all, and reduced to half their height, or even much lower,—for the lower they are cut the better, if there can be any form preserved,—and then shifted into fresh soil, they may make handsome plants the first season, but all the old soil ought to be washed or shaken out. Sometimes the ball is so caked and hard that it will not leave

the roots and fibres; the only way to act in this case is to soak it a few hours, when the soil will leave the roots without difficulty. In shifting to other pots and soil, take great care that the compost is well shaken among the roots, so that they may be solidly potted, for if this be not done there will be a decline of the plant from the first. If the roots, as is frequently the case, have wound round and round the whole pot, and got almost solid, the necessity of pruning the roots must be obvious, but no more should be taken away than is necessary to open them enough to let the soil be well placed in and about all the parts. If a plant is very tall, and any one of the stems is nearly upright, all the rest may be cut away, and the one straight stem with its upper growth be trimmed for a standard. In this case let the branches be cut in to within a few eyes of where they leave the stem, and the part selected for this must be where three or four branches start at the same or near the same height; if there be any single branches start lower down, cut them in quite close, and when the growth of the plant commences rub off all the buds that come where they are not wanted: encourage all the buds that grow below the branches, as they favour the handsome appearance of the head, for this plant, like many others, is apt to grow upright shoots, which are not favourable to standards. As soon as the shoots are three inches long examine which are growing in the direction most favourable to the formation of a handsome head, that is to say, growing horizontally or downwards, and which are growing quite upright; the latter may have all their tops taken off, to encourage side growth, and as that comes, such shoots as are too thick must be thinned out; the growth may then be arranged to the flowering. The dwarf plants as they make their growth will be likely enough to grow where they are not wanted, and remain bare where shoots are required. In this case we should reduce the plant still more, for they would be useless to grow ugly, and the only chance of their growing handsome is to promote lower shoots; in other respects the treatment must be the same as young plants. They may be bloomed in the house in the same manner; they require shifting as soon as their pots are filled with roots. The same soil is proper. When their flowering is over they may be put out of doors, and be partially protected, and in all respects be subjected to the same operations. As pits will not hold the tallest plants, the warmest part of the greenhouse must be selected for their winter quarters; and where they are pushing their bloom buds, they must not be subject to sudden variations of temperature.

GENERAL REMARKS.

The time of your potting cuttings is almost immaterial, and many take the young growth that would give a flower if left on, for the purpose of being able to flower them small; and it is not difficult to bloom them in forty-eight sized pots before the plants are a foot high; but generally the cuttings are taken after the blooming is over, and when the spare wood is cut away from the plant. The young wood strikes freely, but the top three inches of any branch will root with bottom heat and a little longer time.

In whatever state this plant is shown, whether as a standard, when the branches are inclined to be pendulous by means of the weight of the flowers, or as a sturdy bush, the large bright rosy flowers of the double kind are exceedingly beautiful. There are few plants more showy, or more graceful and elegant; there is an advantage, too, which in some cases may be appreciated more than in others,—they can be made to flower at almost any time, and those who have a good many will always have some in bloom. The white variety is a pretty change, and as conservatory plants they are by no means to be slighted, for they will grace the borders or shelves according to their size, at a time when bold and noble flowers are scarce. They have

another advantage—they are a long time in flower, the blooms form a bunch or irregular spike at the ends of the shoots, and come in succession for a long time, while the plant itself is what may be termed handsome, and very tractable. We have seen it on the wall of a greenhouse, trained like a fan peach or nectarine tree, and literally covered with bloom, but it is in no other way so handsome as when grown in pots or tubs as bushes or standards. When carefully managed, constantly pruned, and well attended, it makes a fine conservatory plant, placed in the centre bed, or regularly planted out in the soil of the conservatory: but this, like many other plants of the hard-wooded kind, must not be placed in too rich a soil, for too rapid a growth spoils them, induces lanky growth and frequently a lack of bloom. In this season, when planted out, the borders in which it is placed should be half loam, the other half peat and dung, or if the loam be rotted turves cut rather thick, or the top half-spit of a meadow, it will do without the dung, merely two-thirds loam, and one-third peat earth. We know of no plant so little cultivated considering what it deserves as the *Nerium Oleander* and varieties, and we strongly recommend it as one of the plants in a public exhibition, for it is one of the best.

THE HOLLYHOCK.

BY GEORGE GLENNY.

THERE is little difficulty in the cultivation of hardy perennial plants, but if we desire to improve a flower as well as to grow it properly, some attention must be paid at every step we take;—first, in the selection of plants to which we trust for a beginning; next, to giving them proper soil and situation, and saving seed; lastly, to the sowing, planting-out, blooming, and selecting the best. If there is any dependence to be placed in the saving of seed that can be obtained, a year may be saved at the commencement. We should apply at once to a cultivator, (if we knew one who has advanced farther than anybody else in the improvement of this flower), for as many of his varieties as we could afford to buy that are perfectly distinct, whether it were two or two dozen, the first colours to get being white, yellow, black, dark red, rose, and straw colour. Beyond these we get to all manner of shaded, spotted, and mottled varieties; but if we could only get half a dozen, we should procure the colours we mention, because from these all others would come. Even these we should want selected for their thickest petals and roundest and fullest flowers. Any time between November and March will do for the removal, but the sooner the better. These would set

anybody up for saving seed. But, in the mean time, we should expend a little more for a pinch of his best mixed seed, and go on both ways at once. The seed we sow will save us a season, and probably get us a few novel and good varieties a year before we could accomplish it by saving our own seed.

SOIL AND SITUATION.

There is scarcely any soil or situation in which the hollyhock will not grow and bloom, and on this account it is to a certain extent grown in all large establishments; for even in the midst of shrubs thickly planted, and at the backs of flower borders, in corners, wildernesses, in the sun or in the shade, they will tower above ordinary things and display their pyramids of flowers for a long time together. But, if we want to grow them well, they must have good loam and dung to grow in, plenty of room, and be sheltered from high winds, though not deprived of air nor sun. Distant trees, hills, high walls, or fences, keep off the wind, and some pains should be taken to give them the benefit of the shelter without going near enough to shade them.

PREPARATION OF SOIL.

In beds or borders, for appearance they

ought not to be too close, but for seed they should be planted not farther off than two to three feet, and in a sort of group, not in a row. Having prepared a bed of loam and dung, or if the garden soil be moderately good having dug it or rather trenched it a spit and a half deep, and mixed a little rotten dung with it, it is ready for

PLANTING.

The plants should be placed a good way apart, six plants taking two yards in length and one yard in breadth, but nine just occupying two yards square; that is, take them which way you will, three in a row. By this grouping there is a better chance of mixing the seed, or rather the pollen, to affect the seed. Planted out in November they will soon well establish themselves, although they make very little progress in winter. After any frost, when the ground has become spongy and rotten, each plant must be looked to, and the ground pressed close to the roots, and the surface raked even again. In the spring the surface should be stirred and the plants earthed up, as it strengthens the root and assists the growth fully as much as it does brocoli, cauliflower, or any other crop. Nothing more is required but to keep them clear of weeds until the flower stems begin to rise.

WATERING.

Attention must be paid to the season, because in oppressive dry weather they will require watering;—not if they are merely for ornament; but if they are for seed they will come the stronger and better for it, for the growing of the stems will otherwise distress the roots, and weakness will be the natural consequence.

STAKING.

If the least exposed place you have is, nevertheless, open to heavy winds, the rising stems should be supported by stakes; but this, except for seeding plants, is unnecessary. The luxuriant growth, and the weight of the flowers, makes it necessary in this case, for besides being more liable to catch the wind and break down, they are of more consequence if lost.

BLOOMING.

When they have begun to open their flowers, leave seven or eight buds to bloom, and take the rest off with the top of the stem. There is this benefit derived from the spoiling of the appearance—for such it is to take away two-thirds of the pyramidal form of the hollyhock,—the remaining blooms come large, and all that is effected by high cultivation and excitement is increased beyond the ordinary allowance. The changes that are induced in seeds and in the plants which are raised from them,

are in some measure indebted to extra vigour of the plant; in some cases this is for the worse, in others for the better. Too much excitement, before the flowers of anything are formed, will frequently cause a very much increased vigour in the plant, and poor blooms; but when the blooms are once formed, the excitement caused by the removal of half the flowers and consequently doubling the nourishment of the others, leads to increased size and thickness of petals, and the seeds will always more or less partake of the same quality.

SAVING THE SEED.

Those flowers which are the best in form should be selected on each plant, but deformed flowers should as readily be pulled off. They can do no good and may do harm. The flowering will be soon over, in consequence of the growth being stopped by the removal of the tops of the spikes, and the whole strength being thrown into the remaining few flowers, it will soon be seen which have seeded. When the pods are beginning to turn brown and dry, they should be gathered, saved separately with the names of the flowers they came from, and, when thoroughly dried in the sun, laid by in their proper bags, until the period of sowing, which should be the spring following.

TREATMENT AFTER BLOOMING.

The stems may now be cut down to within three or four inches of the plant, the earth forked all over and left rough, and so left for the winter; from time to time, however, the weeds must be cleared away, and the dead leaves picked off. If it be found that any of the flowers are too double to seed freely, mark them, or make some memorandum that they are to be omitted the following year when the rest are shortened; because there is a chance that by giving the root more to do, the flowers may be somewhat less double and so yield seed. And besides this, plants of the same kind may be placed in poor borders, and thus be induced to seed. We do know, because we have the late Mr. Baron's authority for the fact, that some of his are so double that they will not in the ordinary way yield a single pod. Whether he has ever succeeded by other means in getting seed we hardly know. The same plant which may have been comparatively weak the first season, will grow strong the second, and the treatment of the first has to be repeated in all respects, except that if any plant sends up more than one spike of flowers, all but the strongest is to be removed as soon as it is sufficiently developed for that purpose. With this exception, let the treatment be exactly the same as before; that is to say, remove all but one spike of flowers, and omit to shorten any that would not seed the first time.

TREATMENT OF THE PLANT FOR ORNAMENT.

In the centre of clumps planted with dwarf shrubs, and in vacancies which are two or three feet from the edge, at the backs or at least a yard from the front of borders,—in all places where there are vacancies between shrubs or at the backs of shrubberies of dwarf subjects, the hollyhock is a fine ornamental plant. In no case is it so appropriately disposed of as where its towering spikes rise above the green foliage or diversified borders of more dwarf subjects. The dahlia, with all its variety and brilliance, its abundant blooms and protracted season, may supersede the hollyhock as a foreground subject, but it cannot be planted in the same space nor assume the same figure; for, strange as it may seem, it is difficult to place a hollyhock where it is not an ornament. It does not seem out of place unless it is out of sight. As an object wholly seen, a good hollyhock in the height of the season is a very noble subject. The splendid pyramid of flower, commencing at the top of the bushy foliage and growing upright, is, when at its best, worthy of a place anywhere, even on a lawn. Groups of them in clumps, where their heights are regulated, the tallest being the farthest removed, and the shorter ones gradually descending to the front, which is for dwarf ones only, are an addition to the best conditioned garden or dressed ground, and from their remarkable figure, distance seems to be no object. In the broad belts of plantation which surround a park, or the borders, made on each or either side of a road; in the wilderness, or anywhere else, the towering hollyhock is a permanent and graceful ornament, requiring no further trouble than planting out. In most situations it will stand without support. It will grow up where almost any other subject would be choked, and in the wildest of these places it is scarcely advisable to remove any of the spikes; they may be allowed to bloom in bunches of half a dozen or the single spike, for as the object is merely show, the quality is no eyesore.

PROPAGATION OF VARIETIES.

The propagation of particular varieties is easily accomplished. If the plants are in places where it is wished they should remain, merely fork round the plant, and remove the earth to the root. The suckers or young plants that have grown round the old one may be carefully removed, without disturbing the plant; but upon the whole it is, perhaps, better to dig up the plant, and regularly part it into as many pieces as there are hearts, but in this case plants that have been parted one season, and had one year's strengthening,

ought to be ready to plant in the place from which the old one has been dug up. These pieces should be all planted about eighteen inches apart, and left one season to strengthen, or if it be to plant out for ornament, and nothing occupies the place, they may at once be placed where they are to remain; otherwise, if planted in beds to have one season's strengthening, the earth should be well dunged, and trenched eighteen inches, mixing the dung and mould well together. In all large plantations where the hollyhock only forms a feature among other tall flowers, or towering above short ones, and where it may be desirable to always keep up the feature unimpaired, it is the best way to remove the earth all round, and to cut away the smaller suckers or plants with a sharp knife, leaving the main one unmoved; in this case the bare root should be left exposed to dry before it is covered up. The effect of removing the young ones from the principal plant is to strengthen it, and therefore is generally resorted to in preference to digging up and substituting others. The young plants so removed may be treated the same as if the whole were parted. Keep these always clear of weeds.

RAISING FROM SEED.

Sow the seed (on a bed prepared as if for old plants) rather thinly and evenly, and rake it in so that it be well covered, or sift a little mould over it to make sure; choose a day after there has been some rain to soak the bed well and put the ground in good order. Should the weather be at all dry and parching, see that the bed be watered,—not sprinkled merely, but sufficiently soaked, with a fine-rosed water-pot, that the seeds may not be disturbed. When they are up, hand-weed the bed so as to prevent anything from sharing the space with the seedlings, or depriving them of nourishment; when they have four or six rough leaves, water the bed well, to soak the ground, and draw out the plants wherever they are too thick, so as to leave a good three inches between the remaining plants; and having prepared another bed, prick out the drawn plants three inches apart all over it. The principal attention is now required to keep both beds clear from weeds, and give them water in very dry weather if they appear to want it, for sometimes the earth looks very dry, when it is not so a little below the surface; in fact, watering should never be done often, and in small quantities, but seldom, and in profusion, so that the bed may be saturated some distance down. Nothing is worse for any plant than to be frequently watered, and not far into the soil, for it encourages fibres near the surface, which suffer

from ordinary drought, while the plants seldom but effectively watered, send down their roots after the nourishment that is seldom given at top. Towards the end of the summer these plants may be all transplanted into rows or beds eighteen inches apart in the rows, and three feet from row to row. In the spring these may be earthed up like a row of cabbages or cauliflowers, and when the blooms rise they must be watched: as the flowers are developed the worthless must be forked up and got rid of, to prevent future mistakes. Some merely cut down the flower-stem, and leave the plant in the ground to be sent to market or made to bring something; those, however, who are at work for improved varieties had better always take them up and destroy them, for they are better on the dung-heap than anywhere else. In selecting those which are to be kept, recognise none that do not offer some decided advantage;—very thick petals, very bright or new colours, very double flowers, very good form, or some decidedly good quality. Thickness of petal is a decided point, for it is the most scarce of all; it is the greatest drawback in the hollyhock, that the flimsy petals spoil the colour by their watery transparent nature, and shrivel and burn up rapidly with the heat of the sun, besides which they cannot keep anything like a good form, even if they are disposed to be good. Besides, however, looking among them for varieties with one or other of these qualities conspicuous, there may be some with well-formed flowers, beating present varieties of the same colour, however slight the superiority may be; but it must not dishearten the grower if he find forty or fifty to throw away, for one to save. It may be, however, that some sorts not worth keeping for their own merits as flowers, may, nevertheless, possess some scarce property worth seeding for: for instance, a very thick petal, and good round outline formed with handsome petals, may not be double enough to retain as a flower, but such a plant may be worth saving the seed from one season. Another, a very brilliant colour upon a very worthless bloom in other respects, may be worth keeping through the bloom for the chance of its imparting the colour to a better thing: all these things must be looked to while selecting those which are to stand, but though they may be worth seeding from once, it would be useless trying them a second year. Those intended for propagation, and rearing as new and distinct things, should be labelled, and on the label, or on some record corresponding with the label, they should be described in all their particulars. The propagation of these has been already described; the seedlings will in this respect require exactly the same treatment as

the established plants, and when the seed-pods have been taken from such of the seedlings as were merely retained for that purpose, let every vestige of the old plants be dug up and destroyed.

Among the qualities to be esteemed in new varieties, it must not be forgotten that those which are wide at the bottom of the spike, and have the flowers close together, narrowing the bloom gradually as they proceed upwards, are the best; and that if the footstalks are short, the blooms close to the stem, and therefore crowded and confused, they are by no means estimable. In showing the hollyhock, only a few flowers should be exhibited; two or three rows of flowers at the largest part of the pyramid should be set up, all above should be cut off, and no half-opened blooms or unbloomed buds should be seen. This, with as much of the under-stem as will serve to hold them in the stands, is all that should be shown, and all in a stand should be of uniform height. Three rows are the most effective, the back being the tallest, the middle rather more dwarf, and the front shortest. In some cases the exhibitors are restricted to five flowers, but this is not so good a plan as limited heights, for the reason that they cannot be so uniform. If, for instance, the lowest were restricted to nine inches of flower, and the highest to fifteen, it would allow of the three heights being nine, twelve, and fifteen inches. We can hardly imagine a gayer subject than a number of stands of hollyhocks thus arranged, making all show the same distance apart, and thus preserving not only a neat and uniform arrangement the whole length of the tables, but also affording the judges the greatest facilities for determining the relative merits. At Norwich, where we once saw a very showy display of these flowers, the effect was totally spoiled, some showing whole spikes, with half the length unbloomed, others showing three or four flowers on the thickest part of the stem, a third having a mass of uneven spikes stuck in a box of mould, and flagging for want of proper nourishment; before the day was out the whole spikes had almost fallen over, and the withered tops touched the stand they were shown in. All this is very bad, and betrays great mismanagement.

PROPERTIES OF THE HOLLYHOCK.

With regard to the properties of the hollyhock, the following will be enough for the present; we may be more explicit hereafter.

1. The flower should be round, and the principal or guard petals should be thick, entire on the edges, and lie flat, being free from puckering or frilling.

2. The centre, which is composed of florets, should form half a ball, and the more it covers the principal or guard petals the better.

3. These florets should be thick, large, whole on the edges, perfectly free from fringe, or notch, or raggedness all over.

4. The colour should be dense, instead of watery and transparent or washy, as that of the hollyhock is generally. The more bright and novel the more desirable.

5. The spike should be close, the flowers touching each other, and tapering from the bottom to the top; the footstalks of the flower being longer at the lower end of the spike than at the upper end.

6. There is no fixed height for the plant; but the flowers should begin one foot from the ground, and open all at once.

MONTHLY TREATMENT.

JANUARY.—There is little of anything to do this month, except that in fine weather the plants can be moved about, and that if you have any to buy or remove you cannot be too quick about it.

FEBRUARY.—In most respects the same as last month, except that every day removals are protracted the worse chance they have. They may be taken up and re-planted without damage, but delays are always dangerous.

MARCH.—In fine open weather one-half the seed you intend to sow may be put into the ground, taking the opportunity when the ground is naturally moist, but not wet, to rake it in evenly all over, and sift a little fine mould over it to have it well covered.

APRIL.—Sow the rest of the seed in the same way as the last. If the weather prove very dry, and the ground be parched up or inclined to it, give it a good soaking of water with a fine rose, otherwise the seeds would be washed up, which would at once destroy your hopes: weed the old beds as well as the new seedling beds, and keep everything neat.

MAY.—Thin out the seedlings as soon as they have four or six rough leaves, by taking them out where they are too thick, until those that are left are only three inches apart; and plant out all that you draw out of the beds into another bed three inches apart all over. Water them in, and take the greatest care that these seedling beds are never allowed to dry up enough to destroy the young plants. Before you attempt to thin the seedling beds, water them enough to soak the whole of the soil three inches deep. Fork up the ground all over the beds and groups of established flowers. Sow any seed that may by chance have been left.

JUNE.—Same as last month in all respects, because later seedlings come forward, or the

season may not have brought the early ones forward enough to be so managed last month; and look well to weeding last year's seedlings which are planted out for bloom and have stood out all the winter.

JULY.—The same instructions apply to seedlings that have not already been thinned: weed those already thinned and planted out. Begin also to look after the seedlings that are throwing up their bloom stems. As soon as they begin to open, watch daily, and throw away all that are worthless. It may be worth while to stake those which are in very exposed situations, for they are not always proof against high winds, although they stand a good deal of rough weather.

AUGUST.—All will have bloomed before the present month is out, but this reminds us that some will be found much later than others, and the season of bloom is a point not to be lost sight of. Any that are much earlier or much later than the generality of varieties may be worth retaining for this reason alone, if they are not very inferior in other respects; but by the end of the month the blooming seedlings ought to be reduced to those only which are intended for seed or for propagation. Plant out the seedlings of the present year.

SEPTEMBER.—When the bloom has gone by, or so far declined as to be ugly and unsightly in their places, they should be cut down to the few pods intended to seed, and if not wanted cut down altogether, the dead leaves trimmed off, and seed pods that have ripened should be taken off.

OCTOBER.—Gather the rest of the seed. Cut down the remainder of the plants, and towards the end of the month the forwardest may be parted and planted out to strengthen. Let the beds be prepared properly by dressing for their reception. Dry all the seed well before putting it away in paper bags, or in boxes, but do not rub them out. This is better deferred till sowing time, or till they are wanted to be sent away. Plant out seedlings in their blooming beds, and put out plants where they are to flower.

NOVEMBER.—Part the remainder that are to be propagated, and take off the superabundance of growth from those permanently planted, and dispose of the offsets or young plants as before. Plant out young seedling plants into three rows for blooming, if there be any not yet out.

DECEMBER.—Little more is required than already directed. Keep clear from weeds, stir the earth occasionally, earth up the seedlings in blooming rows, and remove dead leaves. Established plants may still be put out in the borders and places where they are to remain.



THE THUNBERGIA.

THUNBERGIAS are much better raised from seeds than obtained by any other process of propagation. The seedling plants always have about them a degree of vigour which cuttings or layers do not often acquire. To obtain plants for flowering in the garden during summer, the seeds should be sown early in the spring, that is, in February or the beginning of March; and the young seedling plants ought to be encouraged to progress as rapidly as is consistent with sturdy and vigorous development. Few plants are more attractive than the common *Thunbergia alata*, and its now numerous varieties—some buff, some orange, some white; these, too, vary with or without a rich black spot in the centre, which to our view renders those which possess it infinitely preferable to those from which it is absent, looking at the matter in reference to

their ornamental capabilities. The accompanying sketch represents one of the best of them, in which the rich clear orange-colour of the limb is in admirable contrast with the jet-black hue of the throat of the corolla.

The seeds are obtainable in the seed-shops. They may be sown in pots, pans, or boxes, according to quantity. Any sort of light half-spongy soil will be congenial to them; and perhaps none is better than a mixture of the rotted greensward turves from a peaty locality, intermixed with a fourth part of sandy loam, which should be rendered tolerably fine by passing it through a coarse sieve. In sowing, the seeds should be covered about the eighth of an inch with fine soil, and the pots should be set into a frame where there is a moist close heat of from 60 degrees to 70 degrees; they will scarcely need much water

until after they have vegetated, when they must be regularly supplied; in the meantime, the soil should merely be prevented from becoming very dry. When the seeds have fairly germinated, the young plants should be potted singly into small pots, using the same kind of soil. They are to be kept growing in a mild hotbed-frame, but giving them, after they become established, abundance of fresh air daily, decreasing the amount of warmth with the advance of the season, supplying them with larger pots as their roots gain strength and increase, and keeping them at all times near the glass, that they may enjoy the full benefit of the light. Thus will sturdy vigorous plants be obtained by the month of May, fit for any required purpose in-doors, and only requiring to be gradually inured to full exposure to become adapted to ornament the flower-garden, where, however, the warmer and more sheltered the situation selected for them, the more successful will be their progress, supposing all other conditions equal.

There is another way of raising seedlings of plants intended for planting out, which, as it deserves to be extensively known and practised, we may here allude to. It is this:—Instead of using common flower-pots, little squares of thickish turf or sod are cut out; the centre of these is scooped out, and the compost placed in the hollow thus formed; one good seed is sown, and this *requires no transplanting*; it grows for a while into the turf, and is then removed, turf and all, and planted where required, without having had its roots in any way disturbed. The sods are cut about three-and-a-half inches thick, and the little squares are cut to about the same size across; the centre is cut out by an iron scoop of the proper size, forming a hole for the compost about two-and-a-half inches in diameter, and as much or rather more in depth. This is as large as a small-sized pot, and then the roots can also occupy the substance of the sides, which will afford them considerable support. This is an excellent plan of sowing all annuals intended for transplanting; a single seed, or a small patch of seeds being deposited in each turf-pot according to the character of the plant.

Isolated vases of flowers backed by shrubs, are objects too rarely seen in flower-gardens. For such vases, if elevated, trailing plants, like the *Thunbergia*, are particularly appropriate.

BRITISH ORCHIDS.

WE recommend to the attention of plant cultivators the following remarks on the growth of British Orchids, from the pen of a veteran cultivator, Mr. Cameron, late Curator

of the Botanic Garden at Birmingham, and published in the *Journal of the Horticultural Society*, (vol. iii. p. 28.) This group of plants may, in a general sense, be said to have hitherto in a great measure bid defiance to attempts at domestication. Some species, it is true, grow freely enough, and doubtless all would be made to do so, if they were taken up in a persevering spirit by clever cultivators. The attempts, however, that have been made have been too feeble and irresolute, and too often have begun, continued, and ended with little study of the peculiar nature and character of the plants. Mr. Cameron has been tolerably successful in managing terrestrial orchids generally, and in the case of the British species has in some instances succeeded thoroughly. He thus gives his experience in the matter:—

“While tropical orchids have been eagerly sought after, and successfully cultivated, is it not singular that the culture of our native orchids should be almost entirely neglected, many of them possessing as they do considerable beauty as well as singularity of form? They are a tribe of plants which under cultivation would be highly interesting, and the more especially so as several of the species may be grown for years in the open border with little or no care, and most of them may be preserved in pots. Some of them have fragrance to recommend them, particularly *Gymnadenia conopsea* and *Herminium monorchis*, both of which, when in quantity, perfume the atmosphere for some distance—a circumstance which often affords a clue to their discovery, in the absence of which they might have been overlooked.

“The Horticultural Society in their schedule of prizes of the past season offered liberal awards for collections of native orchids, without even stipulating the number or length of time the plants had been under cultivation, but I believe not one was exhibited. To what can this be owing? Not to want of skill to cultivate them, for the skill shown in the management of other plants proves the ability to cultivate these. But a solution of the question is to be found in the fact that the attention of the cultivator has not been turned in that direction. Having, however, whilst residing in Surrey, within a few miles of the natural habitats of many of the species, obtained some experience in their cultivation, and having also at Birmingham continued to cultivate with success such species as could be obtained, I am induced to offer some remarks on their cultivation, in the hope that it may stimulate other cultivators to bestow some attention on this truly interesting class of plants, many of which may be obtained in their own neighbourhoods, and therefore only

require the trouble of digging them up. One season is possibly as good as another for gathering them, whether in flower or not; but, on the whole, spring, at the time they are just commencing to grow, is perhaps the most favourable time, but it requires a knowledge of their places of growth to be able to find them at that season. At whatever time they are got up, it is desirable to get the tubers with as many fibrous roots as possible, and before planting to clear away all the soil carefully from them. They should be planted entirely in fresh soil prepared for them, for I have found that those planted with balls of earth never thrive well, or live long, owing, no doubt, to the native soil becoming sour by being inserted in that of a different texture. I have never found it necessary to use any chalk in the soil, even for those which are natives of chalk hills. When in Surrey, charcoal was not then used as an ingredient in soils for pot-plants, but I have since found it serviceable in the culture of native orchids; it keeps the soil open and porous, and thereby becomes a preventive of sourness and clamminess after heavy rains in winter. Charcoal should also be used in a coarse state for drainage, for their roots run freely amongst it. In watering, the system of little and often is preferable to giving a large supply at one time; indeed, more plants have perished by an over supply at one watering than by all other causes put together; it is also beneficial occasionally to remove some of the top soil, and to replace it with fresh mould, so as to keep the surface pervious to air and sun. The following is a list of sorts with whose culture I have been pretty successful. [They are all perennial herbs, with tuberous or creeping roots, the stems dying down annually. The habit of all the species is similar—a few root leaves, usually lance-shaped, and an upright stem, bearing in a spike-like raceme a greater or less number of blossoms.]

ORCHIS MORIO, *Linnaeus* (green-winged Meadow Orchis).—[From a span to a foot high, with lanceolate dull green unspotted leaves, and a lax spike of scentless purple flowers, the calyx purplish-green, forming a sort of helmet, the lip pale in the middle, with purple spots. Meadows and pastures. Flowers in June.] This is pretty generally distributed over moist clayey soils; it requires to be kept in pots in loam and peat mixed with a little sand; several roots may be planted in one pot, which should be well drained. They may be preserved for years if kept tolerably dry in winter, and sheltered from spring frosts.

ORCHIS MAScula, *Linnaeus* (early purple Orchis).—[About a foot high, the leaves elliptic lanceolate, generally marked with dark

purple spots, the flowers in a lax oblong spike, purple, sometimes fragrant, the lip whitish at the base, and spotted. Woods and pastures. Flowers in June.] Grows on clay soils, chiefly in or near coppices, and in some places is very abundant. It does tolerably well in the open border; if kept in pots, the latter should be rather large, as it makes strong roots. Pot with loam, peat, and sand, using plenty of drainage, and let the plants be kept rather dry during winter, and protected from frost in spring.

ORCHIS FUSCA, *Jacquin* (great brown-winged Orchis).—[From one to two feet high, leaves ovate, oblong, flowers in a handsome spike, the helmet-like calyx greenish-purple, the lip pink or pale purple, with dark spots. Chalky pastures. Flowers in May.] I have had but little experience with this, having only received some plants when in flower last year, and without fibres left to their roots. They were potted in a mixture of loam, peat, and sand, with the pots well drained, and were placed in a cold frame; they ripened their leaves and stems, and again came up strongly this spring, and were doing satisfactorily, until by some oversight they received a deluge of water over head and in the hearts of the leaves, which soon perished, and the tubers probably also perished soon afterwards.

ORCHIS USTULATA, *Linnaeus* (dwarf dark-winged Orchis).—[Four to five inches high, leaves lance-shaped, flowers in a lax spike, calyx dingy purple, lip white, with a few purple dots. Dry chalky pastures. Flowers in June.] This small but pretty species is a native of dry sunny chalk banks, and must be kept in pots at all times in a mixture of peat, loam, and sand. The pots should be well drained, and placed in a cool shaded frame all the year. By a shaded frame is meant one so placed that the mid-day sun does not reach it, and not darkened by a shading of mats.

ORCHIS MACULATA, *Linnaeus* (spotted pal-mate Orchis).—[A foot high, slender, leaves lanceolate with dark spots, flowers in a close short spike, pale purple, more or less spotted or streaked. Pastures and heaths. Flowers in June and July.] Is one of the most common of the British species, and may be treated as a common border plant requiring no care; it may also be cultivated in pots in a mixture of loam and a little peat, and likes a shaded situation all the year. I have grown it in pots for years, and occasionally have found self-sown seedlings come up in the adjoining pots: these seedlings appear to come to maturity in the second year. The seedlings of this and others come up in pots containing dwarf bushy plants, whose foliage covers the surface of the pots.

ORCHIS LATIFOLIA, *Linnaeus* (marsh Orchis).—[From one to two feet high, very variable, leaves lance-shaped, pointed, flowers in an oblong spike, varying from deep rose to pale purple. Marshes and moist meadows. Flowers in June.] Is also a common species in wet meadows, different plants exhibiting considerable variety of colour. It succeeds well in a shaded rather damp border. It may be potted in peat mixed with a little loam, and may be kept out of doors all the year. Seedlings which spring up in other pots have been found to come to maturity the second year.

ORCHIS PYRAMIDALIS, *Linnaeus* (pyramidal Orchis).—[A foot or upwards in height, leaves lance-shaped, sharp-pointed, flowers in a dense pyramidal spike, bright purplish rose. Pastures. Flowers in July.] Is a showy, rather late-flowering species. It has succeeded best in pots; the tubers being small, several may be placed in one pot. It likes loam with a little peat, and plenty of crocks. It should be placed in a cool frame, giving little water during winter.

ORCHIS HIRCINA, *Scopoli* (Lizard Orchis).—[From two to three feet high, leaves elliptic lance-shaped, flowers in a long loose spike, calyx dull greenish, lip lead-purple, pale and spotted at the base, long and attenuated, resembling a lizard; smell strong, like that of a goat. Chalky places, very rare. Flowers in July.] This is a late-flowering, showy plant; but being a very rare species, I never could obtain more than one very small tuber, which was potted in loam, sand, and a little peat, and kept constantly in a frame, where it was preserved for several years, but never attained sufficient strength to flower. From what I then saw of it, I should consider it was not difficult to cultivate. Plants might be obtained from France, where it is said to be more plentiful.

GYMNADENIA CONOPSEA, *R. Brown* (fragrant *Gymnadenia*).—[One foot high, leaves linear lance-shaped, flowers in an ovate-oblong spike, rose purple, very fragrant. Dry hilly pastures. Flowers from June to August.] Is desirable for scent as well as beauty, and will thrive in the open ground for years where the soil is light. When kept in pots, it should be grown in loam, peat, and sand, mixed with crocks, and placed out of doors all the year. This is also one of those species from which self-sown seedlings are sometimes produced.

GYMNADENIA ALBIDA, *Richard* (small white *Gymnadenia*).—[About a span high, leaves oblong, flowers small, white, fragrant. Mountain pastures. Flowers in June and July.] I never had more than one root of this, which was potted in loam, peat, and sand,

with crocks, and constantly kept in a cool frame. It lived several years, but never flowered.

ACERAS ANTHROPOPHORA, *R. Brown* (green Man-orchis).—[About a foot high, leaves ovate, flowers in a loose spike, calyx green, lip yellowish, deeply cut. Dry chalky pastures. Flowers in June.] Should be kept in pots, in loam, peat, and coarse sand, with plenty of crocks. It should be placed in a cool shaded frame throughout the year, and sparingly watered when in a dormant state.

HABENARIA VIRIDIS, *R. Brown* (Frog Orchis).—[From six to eight inches high, leaves nearly ovate, flowers in loose spikes, calyx greenish, lip greenish brown with red margin. Hilly pastures. Flowers in June and July.] Bears cultivation well in pots placed in a shaded situation. As it grows naturally in light, damp, sandy soil, it should have loam, peat, and coarse sand mixed with plenty of crocks, and, the roots being small, several may be placed in the same pot. I have flowered it successively for several years.

HABENARIA BIFOLIA, *R. Brown* (lesser butterfly Orchis).—[About a foot high, leaves elliptic, flowers white in an open spike. Heathy places. Flowers in June and July.] The smaller butterfly orchis grows chiefly on dry chalky banks, and is safest in pots in loam and peat, with plenty of drainers. It should be placed in a cool frame while dormant, and taken out when beginning to grow in spring.

HABENARIA CHLORANTHA, *Babington* (greater butterfly Orchis).—[Taller and stouter than the last, leaves elliptic, flowers in an open spike, white, larger, with a green lip. Moist woods and thickets. Flowers in May and June.] This is a more robust plant than the last. It is to be found in clayey coppices, and should be potted in loam, sand, and a little peat, with drainage, and may be kept out of doors all the year.

OPHRYS APIFERA, *Hudson* (Bee Orchis).—[About a foot high, leaves ovate, flowers distant, calyx pale tinged with purple, lip velvety brown, variegated with yellow markings. Chalky and clayey pastures. Flowers in July.] Should be kept in pots; and, as there are few fibres to the tubers, several may be put into the same pot, using loam, peat, and sand. It should be kept in a frame during winter, and not put out of doors until the flower-stems have become somewhat advanced. Roots brought from Reigate Hill in March, 1843, were still alive this spring.

OPHRYS ARANIFERA, *Hudson* (Spider Orchis).—[Nearly a foot high, leaves ovate, flowers few, distant, calyx green, lip deep brown, hairy, with yellowish lines often resembling the Greek π . Chalky places. Flowers in

April and May.] I never had more than one root under cultivation, which was preserved for several years in a cold frame, potted in loam, peat, and sand, with plenty of drainers. It did not appear to be difficult to cultivate. [The var. *fucifera* differs in having an undivided lip.] Several roots of this variety were received from Kent some years ago, and were potted in a mixture of loam, peat, and coarse sand, with plenty of crocks or drainers. The plants were kept in a cold frame during winter, and out of doors in summer, and were preserved three or four years.

OPHRYS MUSCIFERA, *Hudson* (Fly Orchis).—[About a foot high, alehder, leaves broad, lance-shaped, flowers distant, calyx green, lip and petals brownish-purple, the former with a central subquadrate bluish spot. Damp calcareous thickets. Flowers in June.] Should be kept in pots planted in light sandy peat, mixed with a small portion of loam, the pots being well drained. As the fibrous roots are small, several plants may be placed in a pot. They should be kept in a cold shaded frame the whole year, and watered sparingly while dormant.

HERMINIUM MONORCHIS, *R. Brown* (musk Orchis).—[About six inches high, leaves lanceolate oblong, flowers small, green, on a slender spike. Chalky pastures. Flowers in June and July.] Is a small species, seldom more than four inches high, with small yellowish green flowers, which smell like honey. It should be potted in peat, loam, and sand, with plenty of drainers, and may be constantly kept out of doors; the roots being very small, several may be placed in a pot. It increases itself tolerably by sending out underground rhizomes, at the extremities of which a fresh tuber is formed. It bears cultivation well.

GOODYERA REPENS, *R. Brown* (creeping Goodyera).—[About a span high, leaves ovate, reticulated with brown, flowers small, white, in a narrow spike. Old fir forests in the north. Flowers in August.] Is an extremely scarce species, only to be found in a few fir woods in the Highlands of Scotland. It grows in dense creeping masses, and might be obtained in large patches by paring off the soil on which it grows. The roots do not run deep into the soil, and it is not difficult to cultivate. I have grown small pieces till they covered the whole surface of the pots. It flowers sparingly. It appears to like very light sandy peat, with the pots half filled with drainers, and it should always be kept in a cold shaded frame.

SPIRANTHES AUTUMNALIS, *Richard* (fragrant Lady's Tresses).—[Four to six inches high, leaves ovate oblong, flowers greenish white, small, in a spiral spike. Dry chalky

and gravelly places. Flowers in August and September.] This bears cultivation well. It is generally reputed not to appear in the same place for several years after flowering; but I have always been able to find it within one or two inches of the place where it has flowered, sending out a small rhizome forming a bulb at the point: the old bulb dies after flowering. Several roots may be planted in a pot in loam and sand, using plenty of drainers. The pots may be kept out of doors all the year.

SPIRANTHES CERNUA, *Richard* (drooping Lady's Tresses).—About six inches high, leaves linear lance-shaped, flowers small, greenish white. Found only at Bearhaven, Ireland. Flowers in September.] I received one plant of this rare species from Ireland two years ago while in flower. It was planted in very light sandy peat with drainers. The plant came up well, but unfortunately perished from being overwatered.

LISTERA OVATA, *R. Brown* (common Tway-blade).—[About a foot high, with ovate leaves, and an elongated lax spike of small greenish flowers. Woods and pastures. Flowers in June]. Is a common plant in woods, &c. It thrives well under cultivation either in pots or in the border. For pot culture use sandy loam and rather large pots, which should be kept out of doors the whole year.

LISTERA CORDATA, *R. Brown* (heart-leaved Tway-blade).—[From three to five inches high, with heart shaped leaves, and a short lax spike of minute greenish flowers. Mountain moors. Flowers in July and August.]—This small plant bears cultivation well in pots, using fine sandy peat and plenty of drainers. Being very small, a dozen or more roots may be put into one pot. It may be kept out of doors the whole year in a shaded place.

NEOTTIA NIDUS-AVIS, *Richard* (Bird's nest).—[About a foot high, leaves none, flowers in dense cylindrical spikes, dingy brown. Shady woods. Flowers in May and June.] I never could preserve this species after the first season, although various ways were tried to manage it.

EPIPACTIS LATIFOLIA, *Allioni* (broad leaved Helleborine).—[One to three feet high, leaves broad-ovate, flowers distant, green, with the lip purple, sometimes all purple. Mountainous woods. Flowers in July and August.]—Epipactises, having fasciculated bundles of roots, require much care to get them up in a fit state for cultivating. This species may be grown in pots, in loam, sand, and peat. It may be kept constantly out of doors.

EPIPACTIS PURPURATA, *Smith* (purple leaved Helleborine).—[Near the last, leaves oval lance-shaped, flowers brownish green, with

the lip purple. Woods. Flowers in August.] Is extremely difficult to get up, being generally amongst clay and flints, which are hard and solid, requiring a pick-axe to move them. It succeeds tolerably well potted in loam, sand, and peat, using crocks or drainers, and placing the plants in a shaded situation.

EPIPACTIS PALUSTRIS, *Swartz* (marsh Hel-leborine).—[Twelve to eighteen inches high, leaves lanceolate, flowers distant, calyx purplish-green, lip and petals white tinged with purple. Moist places. Flowers in July.] A creeping species, easily increased by underground runners. It may be planted in peat, in a shaded damp border, where it will grow and multiply speedily. For pot culture use light sandy peat and drainers. The plants may stand out of doors all the year.

CEPHALANTHERA GRANDIFLORA *Babington* (large-flowered *Cephalanthera*).—[A foot or more high, leaves ovate or ovate lanceolate, flowers largish, distant, white. Woods and thickets, usually on calcareous soils. Flowers in June.] I grew this in pots, in peat, loam, and sand; but it seldom or never came up the second year.

CEPHALANTHERA ENSIFOLIA, *Richard* (sword-leaved *Cephalanthera*).—[A foot or more high, leaves lanceolate, flowers white, with a yellow spot in front of lip. Mountain woods. Flowers in May and June.] I treated this the same as the last, but had no better success.

LIPARIS LOESELII, *Richard* (two-leaved *Liparis*).—[Six to eight inches high, leaves broad, lance-shaped, flowers few in a lax spike, yellowish green. Spongy bogs: rare. Flowers in July.] I flowered this several years successively in pots filled with sandy peat. It was kept constantly in a shaded situation out of doors.

CYPRIPEDIUM CALCEOLUS, *Linnaeus* (Lady's slipper).—From twelve to eighteen inches high, leaves ovate, pointed, flowers usually one at the top of the stem, sometimes two, calyx dark brown, long, lip pouch-shaped, yellow, reticulated with darker veins. One of the most beautiful and interesting of our native plants. Dense woods in the north: very rare. Flowers in June.] This is perhaps best grown under a hand-glass in a peat border, where in the course of a few years it becomes so strong as to produce six or eight flowers. It may also be cultivated in pots, which should be kept in a shaded place. The soil it appears to like best is sandy peat, with plenty of drainage.

This is what Mr. Cameron gives as his experience in the culture of these curious plants. We have added under each plant a few brief descriptive particulars, which will serve to convey an idea of their appearance to the uninitiated.

HORTICULTURAL LITERATURE.

MOORE ON THE CUCUMBER.—(Groom-bridge).—Of this little manual of Cucumber growing, there is now a second edition. It is confined to the winter culture of these plants, into which branch of the subject it enters rather fully and circumstantially. The question of ventilation, one of the most important in the whole routine of plant-forcing at an unnatural season, is pretty successfully grappled with; and a plan for warming the cold external air before it is suffered to reach the plants, illustrates a principle which may be applied in a thousand ways in the erection of forcing-houses. Besides the culture of the Cucumber, there are moderately detailed instructions for growing the Persian melons; and we find in the Appendix some plain directions for cultivating mushrooms in the same house with the cucumbers, and also for forcing sea-kale and rhubarb. It is on the whole, a plain, practical, unpretending little volume; and is fully equal to any of the many which exist on the subject to which it is devoted.

THE BOTANICAL LOOKER-OUT.—(Tilt and Bogue).—We are not among those who think that Nature requires any touches of colouring to render her attractive, but still, to a large class her beauties are as hidden treasures. Those who undertake to lead this uninitiated class by the hand, and point out some of her lessons of instruction and amusement, have our warmest sympathy in the execution of their ennobling task. The "Botanical Looker-out" stands before us in this character, professing and hoping to be useful in attracting the many to the study of wild flowers, and awakening the enthusiasm of fresh recruits in this department of Natural History. The volume is virtually intended to attract the uninitiated to this delightful study, but unlike many other introductions, it does not scatter its sugared lumps for the mere child, forgetting that the child requires not this "painting of the lily" to give him a zest for this roaming occupation. Here it is not overlooked that it is the adult only that requires *tempting* into this pursuit, by being led step by step, and unwittingly, to the appreciation of the pleasure and satisfaction that result from a personal examination of "every herb that sips the morning dew." The author tells us that with this view he has brought together from the woods, meads, and mountains, those delicate gems that seemed best suited for his recruiting service.

"Beneath the trees he sat
Among the flowers, and with the flowers he played."

The volume is composed of a series of

monthly rambles through Nature's fair domain, to the habitats of the most interesting of the wild flowers which bloom in each month of the year.

COMPANION TO THE GARDENERS' ALMANAC.—(Baldwin.)—This is chiefly a hash up of some of the illustrated portions from Mr. Johnson's series of monthly volumes, published during the year 1847; and as these volumes consist for the most part of hashes of the information already extant on each particular subject, the Companion may be said to be a second hash, under which repeated cooking much of the original aroma becomes dissipated. It is a book without beginning, without finish, and, as far as we can discover, without purpose, except it be to "use up" some of the cuts of the "Gardeners' monthly volumes."

THE FORESTER.—(Blackwood.)—A good plain honest dissertation on arboriculture, free alike from crotchets, and from pretended scientific mystifications, has been hitherto a desideratum; which, however, the author of this work, Mr. Brown of Arniston, has now supplied. He gives a succinct account, brief but intelligible, of the entire process of rearing timber, from the preparation of the ground for the reception of the infant trees, to their valuation and sale when arrived at maturity; and this is done in a thoroughly practical way. There are some points of management upon which opinions vary, and in some of these we might be disposed to dissent from Mr. Brown's statements and recommendations. Notwithstanding this, it is perhaps the best book that has been recently published relating to rural economy.

MANUAL OF FRUITS.—(Gray, Adams, & Hogg.)—This is a cleverly got up little catalogue of choice fruits, with the various names they bear in different places, securing all those who will take it as their guide, against purchasing the same sort of tree over and over again under the different appellations which they have acquired in different hands. It is, as a fruit catalogue, far superior to any other issued by the trade. It will give some idea of its usefulness to quote a few instances of the mischief it might prevent.

The *Court of Wick* apple might be purchased in ignorance under all these names:—*Fry's Pippin*, *Golden Drop*, *Knightwick Pippin*, *Phillip's Reinette*, *Wood's Huntingdon*, *Week's Pippin*, and *Yellow Pippin*.

The *Golden Pippin* is sold also as *American Plate*, *Balgone Pippin*, *Bayfordbury Pippin*, *Herefordshire Golden Pippin*, *London Golden Pippin*, *Melton Golden Pippin*, *Russett Golden Pippin*, and *Warter's Golden Pippin*.

The *Golden Reinette* is also sold as *Dundee*, *English Pippin*, *Elizabeth*, *Kirke's Golden*

Reinette, *Megginch*, *Princesse Noble*, *Wyker Pippin*, and *Wyggers*.

In this way are we put upon our guard against a fatality which has attended many who were selecting fruit, and after buying fifty trees find they have four or five of a sort under different names. It is partly compiled, no doubt, from the Horticultural Society's catalogue, and is descriptive of the leading kinds of those less known than others which have been long familiar. The descriptive catalogues which have appeared within the last year or two, show a dawn of better things; and purchasers will not now be content to consult long ranks of unexplained and often badly spelled names.

SMITH ON THE PEACH.—If Mr. Smith had been content when he had written his useful little treatise on the cucumber and melon, he might have been set down as a very plain-speaking man, of good practice, endeavouring in his own way to teach others what he knew himself, and to pretend nothing more than he was perfectly competent to fulfil. We fear, however, that those who honestly complimented him on one of his efforts, were doing mischief. The *Gardeners' Gazette* pronounced his work on cucumbers and melons "useful to nine-tenths of the readers;" the *Horticultural Journal* said it was "a work of great practical utility;" Loudon said it was "modestly and sensibly written;" and there is no doubt that the work possessed just as much original thought as saved it from the fate of the thousand things of the kind "got up" for the sake of book-making. We cannot say so much of the peach affair; there is nothing in it that is new and good. The best part of the volume is the names and synonyms of several sorts, taken from the Horticultural Society's catalogue, which, though a much cheaper work, gives us similar information as to all fruits. We hear a good deal of "one person says this," "another says that," "a third says something else," and so on, making up the book of shreds and patches; and, says the author, "my own conviction coincides with that entertained by the majority of growers." Why, this system of book-making is abominable in our eyes; scores of works have been thrust forward in this way, and we verily believe that they have done infinite mischief to the science. So much of pretence, so empty after all, it makes any buyer of a new book who seeks for original thought out of humour with himself and with his own love of gardening. All we can say of this work is, that if any one wants to grow peaches and nectarines, and never read anything about them, he may read this with advantage; but if he have read the old authors, he may let this alone.



CORYANTHES ALBERTINÆ.

Coryanthes Albertinæ, Karsten (Albertini's Coryanth). — Orchidaceæ § Vandææ-Maxillariidæ.

The species of *Coryanthes* are among the most remarkable of the very curious tribe of plants to which they belong. They are also among the largest flowered of Orchids. Two or three species have been for some time known in our gardens, where, however, they have been more prized for the singularity of their structure than for any other property, inasmuch as they do not produce enough of blossoms to render them

very attractive in mere display. Another species has recently been made known; this, which bears the largest blossoms known to exist in this class of plants, was described at p. 89. To these we have now to add the very beautiful and showy species represented in the accompanying wood-engraving; it has not yet reached this country, but is cultivated in German gardens, to which it was introduced by Dr. Karsten. Our sketch and historical particulars are derived from that part of Dr. Karsten's beautiful work in illustration of some of the select Venezuelan plants found during his travels, which has been recently published in Berlin, by M. Decker.

Our engraving, aided by the following detailed description, will convey a good idea of the plant. It is a pseudo-bulbous epiphytal species, that is to say, it grows naturally on or attached by its roots to the stems and branches of trees. The pseudo-bulbs are six inches long, and about two inches in diameter at the base, of an ovate-conical compressed figure, and growing several together, in tufts. On the top of the pseudo-bulbs, two lance-shaped five-nerved leaves are developed; they are a foot and a half long, and three inches broad. From the base of the pseudo-bulbs, the pendent raceme is borne; it grows about two feet long, and supports from five to eight blossoms of large size and magnificent appear-

ance. The sepals are of a pale yellow colour, evenly dotted with purple spots, which are largest at the base and smallest at the apex of the sepals; the central one is obovate, about an inch in length, somewhat three-lobed at the apex; the two side ones are ear-shaped, with a falcate point, and spread out like wings; they are about four inches long, and two inches broad. The two petals are small, lanceolate, yellow, with brilliant crimson spots. The most remarkable part of the flower is the fleshy lip, which is three inches in length, supported by a reddish claw, and divided into three dissimilar parts; the first (the upper part as the flower hangs) is inverted cup-shaped, an inch in diameter, and covered with silky hairs; the next is narrow and grooved, these two parts being a pale rose colour spotted with cherry red; the third part is helmet-shaped, with two large roundish lateral lobes or flaps, and three central or apical teeth; this part is an inch and a half long and as much in width, and is a deep red colour: the style-pillar is white with a few red spots, and has on each side, near the base, a horn-like appendage which secretes honey, a favourite food of the ants and the humming and nectar-birds of its native country.

"I found this most distinct and beautiful species of *Coryanthes*," writes Dr. Karsten, "growing on the branches of the *Aguacate* (*Persea gratissima*, Gærtner), near a cascade, in the valley of San Esteban, at the foot of the Cumbre de Valenzia, in Venezuela; there it was growing in company with *Cattleyas*, *Lælias*, *Gongoras*, and *Stanhopeas* whose fragrance perfumed the atmosphere around."

The species is very rare, the only plants existing in Europe being those in the possession of M. Decker of Berlin, and Mr. Booth of Hamburgh, with whom it has flowered under cultivation: it is an abundant bloomer, and very handsome. It has been remarked that the dark colours in the flowers change to a lighter tint; and this it is suggested may be prevented by placing the plants under glass with a bluish tint, rather than that with the common tint of green. It is indeed highly probable that the effect of light on plants would be found to vary when transmitted through differently coloured media, and if so, the colours of flowers might no doubt be preserved by adapting with this end in view the colour of the glass through which the rays of light were transmitted to them. It is also recommended that, in cultivation, the air about the plants should be kept in continual motion by the play of a fountain, or *jet d'eau*. The idea of a fountain, in connexion with the damp atmosphere required for Orchidaceous plants, is by no means inappropriate. In a moist atmosphere, and a temperature of 18 degrees

Reaumur (about 72 degrees Fahr.) this species was found to grow vigorously and flower abundantly.

The general management of the *Coryanthes* may be thus stated:—Their habit is to throw up from their pseudo-bulbs large and ample foliage, and from the base of the bulbs to produce their pendent flower stalks. They should therefore be so placed, that their position may offer no impediment to the development of the flower spike: this would seem to indicate that they should rather be grown on rough blocks of wood, or in open baskets, than in pots; they may, however, be grown in pots, but in this case, the base of the plants should be well elevated above the rim of the pots. In the spring when the buds begin to swell, indicating the renewal of their growth, they require a liberal supply both of moisture and of heat. This is the proper period for readjusting them in their pots or baskets, if they require removal. When grown in baskets, small pieces of turfy peat soil are to be adjusted about their roots, these being intermixed with other lumps of broken charcoal or potsherds. If they are grown in pots they should be potted at least two inches above the rim of the pot, among rough turfy peat and charcoal. Those attached to blocks seldom need removal when once established; and for this reason good sized blocks should be originally used. After this readjustment they must be cautiously watered for a week or two, or at least while they are seen to be pushing out new roots. When they have matured their growth a somewhat drier system of management should follow, in order that the bulbs may get well matured. At no time must stagnant moisture be suffered about their roots. They are increased by dividing the masses of pseudo-bulbs, which is best done some time previous to the removal of them, in order that they may form an independent system of roots.

There is another mode of disposing of those orchids which throw out their flower spikes from the base of the plant; and this it may be well to notice briefly. Instead of attaching the plant to a suspended block of wood, or planting it in a basket of open-work, it is fixed on an upright stand, formed of some stout tortuous forked tree-branch. The lower end of this branch is so adjusted as to support the upper part in an erect position; this upper part may be of any conceivable form to support one or several plants. The end of the fork is, however, to be trimmed to the form of a blunt cone, on which the base of the plant is to rest. If temporarily fixed there by copper wire, the roots will soon fix it permanently; and the base of the plant being free, no obstruction is offered to the protrusion of the flower stem.

NEW FLOWERS AND PLANTS.

SCHWERINIA SUPERBA, *Karsten* (superb *Schwerinia*).—*Melastomaceæ* § *Melastomeæ-Lavoisierææ*.—A splendid shrubby plant growing from six to ten feet high, with smooth round stems, deep green leaves, and beautiful crimson blossoms. The leaves are opposite, lance-shaped with a lengthened point, three inches long by one inch broad, three-nerved, and crenulate on the margin. The flowers are erect, an inch and a half across, solitary, in the axils of all the leaves near the termination of each branch; they have five obovate spreading petals, of a brilliant crimson colour, and in the centre a tuft of ten prominent yellow horizontal anthers. It is likely to prove an exceedingly ornamental plant under cultivation. Native of Venezuela in dry sunny places, chiefly precipices, on the Cumbre de Valenzia, at an altitude of 3,000 to 5,000 feet. Introduced to the garden of M. Decker, at Berlin, about 1847. Flowers in December in its native habitats. *Culture*.—Requires a temperature intermediate between a stove and greenhouse. Dr. Karsten, its discoverer, found it blooming in a mean temperature of 14 degrees Reaum. (63 degrees Fahr.) or even cooler; turfy peat and loam; propagated by cuttings planted in sand, and placed in a hotbed.

GRISCHOWIA HIRTA, *Karsten* (hairy *Grischovia*).—*Melastomaceæ* § *Melastomeæ-Osbeckiææ*.—A very ornamental plant of upright branching habit, growing from two to three feet high, more or less hairy, with small leaves, and very numerous and showy rosy-purple blossoms. The stems are quadrangular and densely hairy. The leaves are opposite, elliptical, about an inch long, seven-nerved, hairy. The flowers are produced in trichotomous cymes at the ends of the numerous branches, and fresh buds are continually formed, so that the plant continues for a length of time attractive; they have four oblong-roundish petals of a pretty rosy-purple colour, and in the centre of these is a tuft of bright yellow horizontal stamens; they have very short stalks. It will probably prove to be highly ornamental under good management. Native of Venezuela, on the Cumbre de Valenzia, at an altitude of 5,000 to 6,000 feet, and chiefly in sunny and airy places on the ridge of the mountains. Introduced to the garden of M. Decker, at Berlin, about 1846, by Dr. Karsten. Flowers in its native habitats in November and December. *Culture*.—Requires a temperature intermediate between a stove and greenhouse (under 60 degrees Fahr.); turfy peat and loam; propagated by cuttings planted in sand and placed in a hotbed.

ALLAMANDA SCHOTTII, *Pohl* (large-flowered

erect *Allamanda*).—*Apocynaceæ* § *Willughbeiaæ*.—A very beautiful plant. It is an erect growing shrub, apparently not growing to a large size, and flowering when two feet high. It is everywhere glabrous except the younger shoots and petioles; the older portion of the stem is verrucose. The leaves grow in whorls of three or four, they are large, lanceolate, acuminate, tapering below into a short petiole. The flowers grow in large terminal panicles; they are numerous and very handsome, very large, funnel-shaped with a long narrow tube, of a rich full yellow, deeper in the throat; the limb is formed of five roundish spreading segments, which give the flower a diameter of nearly four inches. Native of Brazil. Introduced in 1846. Flowers from June to September. *Culture*.—Requires a stove in the growing season; turfy peat and a little loam and sand; propagated by cuttings planted in sand, and placed in a hot-bed.

ACACIA ONCINOPHYLLA, *Lindley* (hook-leaved *Acacia*).—*Fabaceæ* § *Mimosææ-Acaciææ*.—A pretty shrub, rather stiff growing, attaining a height of six or seven feet, with striated branches, sparingly clothed with linear-falcate, submucronate-acuminate phyllodia (leaf-like bodies). The flowers grow in axillary, sessile, dense, cylindrical twin spikes, which are formed chiefly of the numerous threads or filaments of the stamens, and have thus some resemblance to a bottle brush; they are of a deep orange colour, and scent the air with their agreeable fragrance; and they are so numerous as to load all the younger branches. Native of the Swan River colony. Introduced about 1844. Flowers in the early spring months. *Culture*.—Requires a greenhouse; loam and peat; propagated most readily by seed.

CLERODENDRON SCANDENS, *Beauvois* (climbing *Clerodendron*).—*Verbenaceæ*.—A very pretty climbing shrub, well adapted for growing over a trellis in a pot. The stems and branches are bluntly four-angled, and slightly pubescent. The leaves grow in pairs, remote, cordate-ovate, more or less downy. The flowers are borne copiously in corymbs, on peduncles which spring from just above the axils of the leaves, and exceed them, so that the several corymbs towards the ends of the branches form a large leafy panicle; the blossoms are white, beautifully tinged with purple, and with long projecting stems. Native of Sierra Leone, whence it was sent to Messrs. Lucombe, Pince, and Co. by Mr. Whitfield. Introduced about 1845. Flowers in December. *Culture*.—Requires a stove;

turfy peat and loam ; propagated by cuttings, planted in sand, and placed in heat.

CLERODENDRON CAPITATUM, *Schumacher* (capitate Clerodendron). — Verbenaceæ. — This is a beautiful and noble plant introduced to our gardens by Messrs. Lucombe, Pince, and Co. Its habit is handsome ; it has bluntly four-angled branches, the younger parts clothed with spreading fuscous hairs. The leaves are large—from four inches to a foot long—the smaller ones subovate, the larger ones obovate-oblong, acuminate, and entire, but undulated on the margin, the surface netted with veins. At the ends of the shoots the flowers are borne in a dense head, the calyces, or bases of the flowers forming a close tuft, and the numerous blossoms—themselves five inches long—protruding on every side, and forming a broad spreading head ; the blossoms are creamy white, with a long slender tube, knee-jointed in the upper part, and they have a limb of five spreading obovate segments, with long projecting stamens ; they are very fragrant. Native of Sierra Leone, whence it was sent by Mr. Whitfield. Introduced about 1846. Flowers in autumn ? It is the *Volckameria capitata* (Willdenow). *Culture*.—Requires a stove ; turf peat and loam ; propagated by cuttings planted in sand and placed in heat. It flowers while the plants are small.

CERATOSTEMA LONGIFLORUM, *Lindley* (long-flowered Hornberry). — Vacciniaceæ. — Very beautiful ; perhaps one of the prettiest of evergreen shrubs. The stem and branches are hairy, the latter clothed with scattered, smallish, oblong, smooth, entire leaves, which are without stalks, and of a leathery texture ; their edges are slightly revolute. The flowers grow in loose clusters at the end of the shoots, and are of a rich purple colour, or, according to Mr. Lobb, the discoverer of the plant, scarlet ; the corolla is two inches long, cylindrical, deeply notched at the end into five sharply pointed teeth. Native of the mountains of Peru, at an elevation of 12,000 feet. Introduced about 1847. Flowers in — ? *Culture*.—Requires a cool green-house, and will probably associate well with Camellias ; turf peat soil ; propagated by layers, by inarching, or by seeds.

CÆLOGYNE BRUNNEA, *Lindley* (russet Cœlogyne). — Orchidaceæ § Epidendrææ-Cœlogyinidæ. — An epiphytal plant, with a short tapering stem, bearing at top about two broad oblong leaves, from six to seven inches long. From the root springs up the flowering scape, supporting a flexuose raceme of seven or eight flowers, which are large, being nearly two and a half inches across, but are not very showy, owing to the dulness of their colours ; the sepals are acuminate, the petals

linear, somewhat lanceolate, and the lip oblong and three-lobed, and strongly three-ribbed ; these blossoms are of a pale greenish yellow, without any markings except on the lip, which has a few brown spots towards the base, a broad brown band along the middle of each side lobe, and three vermilion-coloured streaks in the centre. Native of the East Indies. Introduced in 1844. Flowers in November and December. *Culture*. — Requires a stove ; turf peat and loam ; propagated by division of the plant.

LIPARIS FERRUGINEA, *Lindley* (rusty-lipped Liparis). — Orchidaceæ § Malaxææ-Liparidæ. — An epiphytal plant of little beauty, with short, nearly cylindrical compressed pseudo-bulbs, oblong leaves, tapering to the base, and a scape arising from the pseudo-bulb nearly two feet long, covered with small spreading pale green flowers, which have a rusty-brown, fleshy, abruptly-reflexed linear lip. Native of Penang. Introduced in 1847. Flowers in January. *Culture*.—Requires a stove ; turf peat soil ; propagated by division of the plant.



SCHWERINIA SUPERBA.

Schwerinia superba, Karsten (superb Schwerinia). — Melastomaceæ § Melastomeæ-Lavoisierææ.

Our gardens already contain many handsome Melastomeaceous plants, and many more remain to be added. The engraving which accompanies this notice represents one of these latter, which is cultivated at Berlin, and

which will doubtless soon find its way to this country. It is one of a collection of plants made by Dr. Karsten, in Venezuela, and has been recently published in a German work* written by Dr. Karsten, and intended to illustrate a series of the most ornamental of the plants thus obtained.

Schwerinia superba, as cultivated at Berlin, and represented in Dr. Karsten's book, is a splendid shrubby plant, attaining a height of from six to ten feet, and bearing a profusion of rich crimson blossoms, which in colour and size are not inaptly compared to those of the single red *Camellia japonica*. The stems are round and smooth. The leaves are deep green, and small in proportion to the size of the plant and of the blossoms, being about three inches long and one inch broad; they are opposite, lance-shaped with an elongated narrow point, three nerved, crenate-toothed on the margins, smooth and shining on the upper surface and paler beneath, where they are also hairy near the nerves. The flowers grow singly from the axils of the leaves, but are very numerous towards the ends of the branches; they stand erect, and measure from an inch and a half to two inches in diameter; the calyx is turbinate with a spreading five-angled limb; within this are the five obovate petals, spreading out so as to form a cup-shaped blossom; they are of a brilliant crimson colour, the tint of which is heightened by contrast with a prominent central tuft of ten large horizontal yellow stamens, which are nearly an inch long, and lie in a sort of bundle across the centre of the flower.

The genus *Schwerinia* is dedicated by Dr. Karsten to His Royal Highness the Grand Duke of Mecklenburgh-Schwerin. One other species besides that here noticed is described under the name of *Schwerinia barbinervis*, (Klotzsch.)

Our present subject was met with on the Cumbre de Valencia, between the towns Puerta Cabello and Valencia, in Venezuela, growing in dry sunny places, chiefly on precipices, at an altitude of from 3,000 to 5,000 feet. Dr. Karsten found it in December just beginning to unfold its blossoms, in a mean temperature of 14 degrees Reaumur, which nearly accords with 63 degrees Fahrenheit. It will however succeed in a somewhat lower

temperature. Its discoverer regards it as one of the best show plants lately introduced to European gardens, and the representation given of it justifies the conclusion that it is an exceedingly handsome plant, and one which may be cultivated so as to develop its beauties under artificial treatment.

We cannot speak with much certainty as to its culture. It is no doubt an easily grown plant; and from what has been already stated, it will be apparent, that it would most probably thrive best in a temperature about intermediate between those usually maintained in our stoves and greenhouses; probably when no intermediate structure exists, the coolest part of the stove—(there is an advantage in not having these buildings quite equally heated all over)—will be found to suit it. It will require all the light it can receive, as it naturally grows fully exposed; and the presumption is, that a very moist atmosphere will not be quite agreeable to it, except at particular stages of its growth. For plants of this character, a suitable compost consists of equal parts turfy peat and turfy loam of sandy texture, a little sand being added or not, according as the loam is more or less sandy; and a good proportion of charcoal in lumps about as large as nuts and walnuts being intermixed with the soil at the time of potting. The pots must be well drained with broken potsherds and rough charcoal. It may be increased by means of cuttings of the young shoots before they reach a flowering stage; and these should be planted in very sandy soil, and either placed in a mild hotbed, or else placed in a shady part of the stove, under a hand glass, and where they will obtain a slight degree of bottom heat.

We believe the plants have but recently found their way to the gardens of Berlin—probably during the year 1847.

NEW SEEDLING SOCIETY.

WE have seen the prospectus of the Central Seedling Society, founded on the articles which have so often appeared in this work on the subject of improving races. We have always considered this the most important part of Horticulture and Floriculture. It is easy to cultivate flowers, fruit, plants and vegetables, but it does not advance us to merely perpetuate the good things we have. What we have always endeavoured to enforce is the necessity of producing new and better things than we at present possess. The greatest reward any body who raises a new thing can hope for, is a good sale for it. This good sale can only be had by making known its merits, and the only way to convince the public of this, is to submit the subject to some compe-

* *Auswahl neuer und schon blühender Gewächse Venezuelas* (A selection of new and beautiful flowering plants of Venezuela). This is a beautiful work, deserving commendation not only for the beauty and accuracy of the drawings which accompany the text, but also for the enterprise of the publisher, M. Decker of Berlin—himself the successful cultivator of the plants which form the materials for the work. The size is a large quarto, a plate with accompanying letterpress being devoted to the elucidation of each species.

tent person or society, whose report is considered authoritative. The Seedling Society is one of the best establishments that could be thought of, because without incurring any great expense the rearers of flowers can at all times send their specimens for opinions, and on set occasions the exhibitions might be opened for the free admission of the members and all the friends they like to introduce. The constitution of the Society is good, the objects are good, the effect of it must be good; and a very brief notice of its plan will suffice to show all this. There can be no want of means neither, because certificates cost but little, and the highest ambition of a raiser if an enthusiast, or the greatest hope of a dealer if even a hungry one, is to obtain that evidence of the value of his production that will inspire the public with a proper notion of its superiority. Let us examine them more, for this Society is likely to carry out our great aim in this work, the improvement of races.

The Society is to consist of members paying five shillings per annum for the privilege of sending up to the Board as many new productions as they please, and the number of members to be unlimited.

Non-members are to be allowed to send

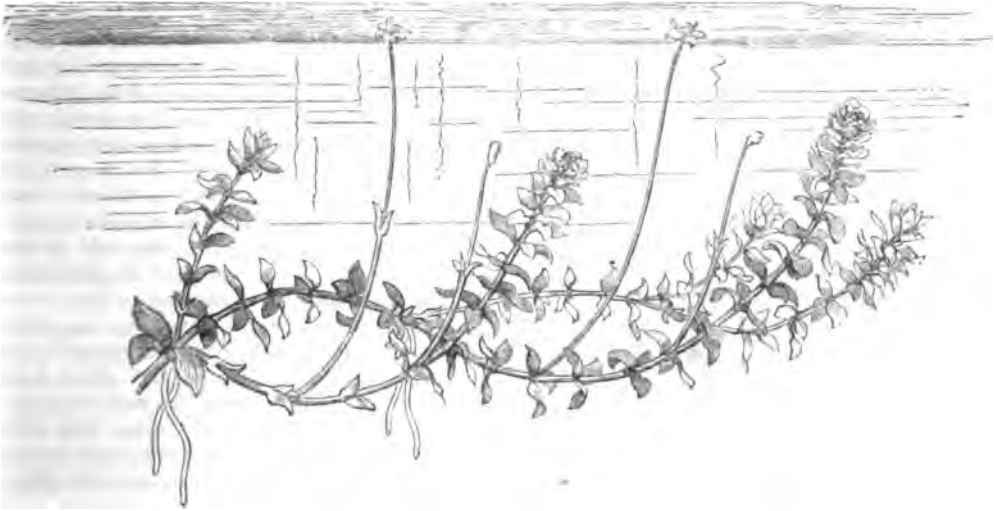
productions on the payment of a small entrance.

The members at large to choose a board of judges from those most capable of deciding upon the merits of fruit, flowers, plants and vegetables.

These judges shall meet once a month during the whole year, on the day the Horticultural Society holds its meeting in Regent Street. At these meetings all the members may attend and introduce friends, the judges being at liberty to retire to award certificates.

Members and non-members to be allowed to produce at the meetings any new or curious or well grown subject for the inspection of the meeting and for discussing its merits, but if shown for certificate to be entered in a regular way.

With the details as to electing officers, and various other matters of secondary importance, we have nothing to do, but we rejoice that a society is at length formed exclusively devoted to the promotion of seedlings, and we trust that, in conjunction with many articles which give excellent instructions on the subject, it may be the means of encouraging the most interesting of the various branches of gardening, the production of new and improved races.



ANACHARIS ALSINASTRUM:

A NEW BRITISH PLANT.

THIS plant has lately been brought into notice as an addition to the British Flora. It is an aquatic, and was discovered in Leicestershire in July 1847, growing in some reservoirs adjoining Foxton locks on the canal near Market Harborough. The merit of first directing attention to the plant is due to Miss Kirby of Lubbenham Lodge; she had not observed it in previous years.

Some discussion has taken place as to the name which the present species should bear. It belongs to a group of plants which appear not to have been very successfully characterised, probably from the want of complete materials to work on; and hence this little water plant has been severally supposed to belong to the genera *Elodea* (Richard), *Udora* (Nuttall), and *Anacharis* (Richard); the choice

was however found to be restricted to the two latter, the former being superseded; and Mr. Babington has recently (*Annals of Natural History*, Series II. i. 82) argued that the two latter are synonymous, and gives preference to the name *Anacharis*, as having the claim to priority. Most of the allied plants are North American; and that found in Leicestershire may prove to be identical with one of them, but the materials which have been obtained do not afford the means of determining this with accuracy.

The genus *Anacharis* is composed of perennial aquatic herbs, with whorled or opposite sessile leaves, and dioecious axillary flowers, both the male and female blossoms being six-parted. Our present subject has been named *Anacharis Alsinastrum*, from its resemblance to the *Elatine Alsinastrum*. The following particulars are gleaned from the description given by Mr. Babington:—



Anacharis Alsinastrum.

a. Whorl of leaves; b. Female flower, magnified.

Anacharis Alsinastrum, Babington (elatine-like *Anacharis*).—Hydrocharidaceæ § Vallisneriæ.—A submersed aquatic plant, with a round semi-transparent solid stem, several feet long, branching at irregular and distant points, throwing out long thread-like diaphanous roots from the points at which the branches have sprung, and clothed throughout with whorls of leaves, three (rarely four) in each whorl, oval-oblong, obtuse, and minutely and closely

serrulate; the uppermost leaves blunter than the lower ones. No male flowers have been found. The female flowers are solitary, from the axils of the upper leaves, with sessile linear deeply-bifid sheaths; the flowers are sessile, their tube being very long (so as to reach the surface of the water) and filiform, with a six-parted limb, the segments of which are oval and similar, but the three interior ones are rather narrower and more acute, the outer green, the inner translucent, white; filaments three, subulate, without anthers; style adnate to the tube, with three ligulate notched fringed reflexed purple stigmas.—Found in ponds connected with the canal at Foxton locks near Market Harborough, Leicestershire, flowering sparingly, in the beginning of September 1847.

The Rev. A. Bloxam writing in the *Phytologist* remarks:—"Miss Kirby was kind enough to accompany me to the place in October last, and I found the plant in considerable abundance, growing closely matted together, and the upper portion floating on the water. She had not observed it in former years, and the reservoirs had been cleaned out two years ago. The canal had been made about thirty years, and the reservoirs (about a quarter of an acre in size) were then formed for collecting the waste water from the upper locks, and conveying it to the lower ones. The only conclusion I can come to in reference to its discovery in Leicestershire and elsewhere is, that the seeds have lain dormant in the localities where it has been found, and that some peculiarity of the two past seasons has caused them to vegetate. I have seen but few specimens of the plant in flower; they were female plants with the stigmas beautifully plumose or fringed. Several of the specimens which I collected had the peduncles of the flowers still remaining, which were shortened or elongated (not in a spiral manner like the *Vallisneria*) according to the distance of that portion of the stem from whence they sprang, from the surface of the water. In the American species the male flowers, which are also axillary, but sessile, become detached and rise to the surface, where they float, and thus come into contact with the female blossoms." This curious adaptation of means for the perpetuation of the plant, is one of the many instances among plants which seem especially calculated to excite our reverence for the Creative wisdom which of old decreed, that the "herb yielding seed after its kind" "shall not fail."

Miss Kirby relates, (*Phytol.* iii. 30,) that wishing to make an alteration in the arrangement of a specimen of the *Anacharis* that had for some months been pasted on paper, and had taken its place in her Herbarium, her

attention was attracted (on damping the paper for the purpose of disengaging the specimen,) by the avidity with which the plant absorbed the moisture. Upon this she plunged the specimen into water, and had much pleasure in seeing it, with the elasticity of a moss, speedily revivify, and become restored to its original freshness. This is a curious property, not often possessed by flowering plants.

The authenticity of the plant as a genuine aborigine is open to some doubt. Since the announcement of the Leicestershire discovery, the same or a closely allied species has been found in an ornamental pond at Leigh Park near Chichester, and in a pond in a garden at Collinges near Dublin. In the former case, there seems a probability that it was introduced accidentally with the roots of *Nymphaea odorata*, received by the gardener a few years since from America; and in the latter it is growing in company with Aponogeton, and other rare aquatics, and was in all probability introduced with them. The knowledge of these facts throws doubt on the Leicestershire habitat, although no circumstance of the kind has transpired in reference to it. The manner of its growth—wholly submersed—may, however, account for its having been so long overlooked, supposing it to be really indigenous.

Our illustration is taken from a beautiful drawing of the plant by Mr. J. W. Salter, published in the *Annals of Natural History*, (Ser. II. vol. i. pl. 8.) The flower represented—the only one obtained by the artist—was however doubtless imperfect, having two only instead of three stigmas.

THE GRAPE MILDEW.

MANY persons would think themselves unwilling to believe, that one portion of the vegetable kingdom preys upon another; and yet it is as truly the case, as that some animals prey upon other animals. Those who would be disposed to dissent from the statement that such is the case, would do so in the absence of reflection: that, would soon show them their error. For instance, the Mistletoe derives its support entirely from the trees on which it grows; and sometimes where it abounds it does material injury, if it does not destroy the trees. The Dodder is another parasite, even more dangerous, often entirely destroying the herbs to which it becomes attached almost as soon as it has germinated from the seed of its parent. Various other plants are known to live by their underground connexion with other living plants; and this indeed has been but recently noticed in the case of some plants which had never been supposed to derive their nourishment in so clandestine a way. But besides all these, there is another class of vegetables whose

attacks are even more insidious and dangerous; these are the minute microscopic fungi; they indeed prey upon, and, unless their progress is arrested, destroy the plants they attack, if circumstances do but continue favourable to their development; and from their very nature they do not so much attack isolated as they do congregated plants, destroying all before them. Every one must have seen plants affected with mildew—that blight that seems at once to envelope them in a grey funereal shroud; and few who have attempted the art of culture are unaware of the difficulty of removing this pest when it has once fairly established itself—which it may often do unobserved, so silently and stealthily does it carry on its work of destruction. Sulphur is held to be a specific against mildew, but its success depends greatly on the time and circumstances of its exhibition.

Heaths are familiarly known to be subject to attacks of mildew, and so are peach trees; but we are not aware that there is any account of the grape vine having been materially affected by an agency of this kind, prior to last year, when an account of such an attack was published by the Rev. M. J. Berkeley, in a garden newspaper,* from which we transfer some particulars for record in our pages:—

“The Grapes in the neighbourhood of Margate have for the last two years been attacked by a peculiar mildew of a most destructive character. We do not recollect that this has been observed elsewhere. A short notice of it will be found in the *Gardener's Journal*, (p. 212, 1847,) from the pen of Mr. Tucker, gardener to J. Slater, Esq., of Margate, who has paid much attention to its progress and development, and after becoming thoroughly acquainted with its nature, with the assistance of a powerful microscope, which was at his disposal, at last succeeded in materially arresting its ravages. Every Vine, whether in the open border or in houses, was more or less attacked. The disease appeared on the young shoots and leaves in the form of a white meal, which spread upon the racemes and ultimately on the grapes themselves, causing them to crack and swell, and accompanied by a very strong unpleasant smell, and ending in the total decay of the fruit.

“On examination, the disease proved to be a parasitic fungus, nearly allied to the peach mildew, but of a different species, and of a far more vigorous growth. The tissue of the leaves is traversed by a branched mycelium, which at last makes its way through the stomates, producing at the tips of the erumpent filiform articulated shoots, which are thickened upwards, two or three large oval or

* *The Gardener's Chronicle*, 1847.

oblong spores, which occasionally acquire one or more septa, and contain a granular mass. The mildew is not confined to the lower surface of the leaves, though it is most frequent there, in consequence of the looser tissue and more frequent stomates. The fungus is a species of *Oidium*, which had not been previously observed. It is well known that the species of a peculiar section of this genus have long been supposed to be the mycelium of several species of *Erysiphe*. In the present instance no *Erysiphe* has been observed. The great objection to their being considered simply as an early stage of a more highly developed fungus, is that the bodies which separate from the threads germinate very readily. Is it not, however, possible that this may be a case of alternation of generations analogous to what has been ascertained to take place in the animal kingdom? The constant connexion of certain genera of fungi, or of individual species of particular genera, both of which have reproductive spores, such as *Tubercularia* and *Sphæria*, *Fusarium* and *Peziza*, *Uredo* and *Phragmidium*, together with *Xenodochus* and some *Puccinias*, seem to indicate something of the kind. This would be a most interesting subject for investigation."

Mr. Berkeley has in the place quoted characterised the *Oidium* to which the grape disease is attributable, as *Oidium Tuckeri*: "fertile threads elongated; spores large, elliptic, or oblong, at length septate. The spores, probably from their larger size, fall off sooner than in the other species, and consequently do not form moniliform threads."

"The first remedy tried, a solution of common salt, was not successful, perhaps from its being made too strong. A mixture of sulphur and lime water was then carefully applied to the whole surface affected, by means of a brush and sponge, and in some instances simple friction with the hands, which were first dipped in plain water, and in both cases with great success. There were in consequence good grapes in the houses where the disease was studied, while in the next garden the destruction was more or less complete, and in one grapery not a single bunch of grapes or even a leaf was to be seen."

This case affords a strong illustration of the importance and value of microscopic observations.

SPRING-FLOWERING BULBS FOR GREENHOUSE DECORATION.

THOSE who neglect to grow a number of the available bulbous plants, in pots, for the decoration of their greenhouses in early spring, forego a great amount of the variety and

attractiveness of which they are capable. We do not now refer to commonly-grown things, as *Hyacinths*, *Narcissus*, *Persian Irises*, and such as these; but to those which are very rarely met with, and which yet might be seen everywhere, inasmuch as they are neither rare nor expensive, neither are they in any respect difficult of culture.

Foremost in this group of plants we should place *Lachenalias*, which we should prize for their yellow flowers. The habit of these plants is very elegant: two or three leaves emerge from the soil, and from the centre of these arises an erect stem, varying in height in the different kinds which are most worth cultivating, from six inches to a foot; two-thirds of this stem is covered with blossoms, which are tube-like, and hang nearly perpendicular one above another all round the stem, remaining a considerable time in perfection, and opening so that nearly the whole spike of flowers is expanded at one time. They are easily grown. About August, the roots having for some time been in a dry dormant condition should be repotted—singly, or two or three in a pot, according to taste—in a compost of turfy peat and loam, well drained; they will soon begin to grow, and must be moderately supplied with water; they may be wintered on a shelf in the greenhouse. About April, and early in May, they will naturally come into bloom, and may be had earlier by accelerating their development in a gentle heat. The species we should prefer are *Lachenalia pendula*, *tricolor*, and *luteola*; all of which may be said to have yellow blossoms, the latter having in addition a touch of green, and the two former a belting of red.

Next in order, we should place the *Scillas*, which we should mainly prize for their blue flowers, of which various tints are afforded by the different kinds. The same kind of treatment as that given to *Lachenalias* would secure them in perfection; they are mostly rather small plants, and should therefore be planted several in a pot, so as to form a moderate-sized tuft, which, moreover, would be more effective if the bulbs were placed near together—not so near as to crowd each other—towards the centre, than if they were formally set at equal distances around the margin of the pot, as is commonly done. Of these there are many kinds which might be employed; we should perhaps select as sufficient for our object, *Scilla præcox*, *bifolia*, *amæna*, and *sibirica*; all of which have blue or purple flowers. There is besides a variety of *S. bifolia* with white flowers, and another in which the flowers are pink; these would be desirable additions. They would flower along through March and April, some perhaps earlier, especially if gently forced.

There is then the plaited-leaved Snowdrop (*Galanthus plicatus*), which has larger and more ornamental blossoms than the common snowdrop, and grows well in pots; this is a very pretty plant, conspicuous when placed among flowerless plants, from its own snowy whiteness. It may be managed in the same way as the others, but needs even less care.

Thus, even with this limited selection, we should have a supply of yellow flowers, of blue flowers, of pink flowers, and of white flowers; and, besides these various colours, a fair variety of character and appearance. With these materials alone a tolerably cheerful aspect could be given to a greenhouse, if they were aided by having healthy-looking though flowerless plants about them. But if such as these, and many others which might be as easily had, were superadded to the flowers now usually met with—namely, Hyacinths, red, white, or blue; Narcissus, yellow; Chinese Primrose, purple or white; Camellias, crimson or white; Acacias, yellow; and more or less of others, how they would assist to improve the appearance of greenhouses, by offering at an early season a variety of form and colour, a little taste in the distribution of which would produce an effect which but few persons would believe it possible to work out from such simple materials. We advise all who are without them now, to make up their minds not to be without them another season.

CONTEMPORARY WRITINGS,

AND ORIGINAL NOTES CONNECTED WITH HORTICULTURE
AND NATURAL HISTORY.

PLANTING HOLLIES.—I believe that spring is the best time, and the last three weeks of April the very best time of all the year, for moving Hollies; and I believe that November is the very worst season (August not excepted) for that operation, and this for the following reasons:—1st. Upon repeated trials during the last twelve years upon various soils, with plants varying from six inches to ten feet in height, I have found plants moved at this season (April) flourish quicker and better than those moved at any other. 2d. Because I have taken up at this season plants which had been moved in the previous November, and on examining them have found not a particle of fresh fibre; and I have noticed that such plants, however well they might look during the winter, suffer exceedingly as spring advances; whereas on taking up in April plants moved in February, *i.e.* six weeks or two months before, I have found that they had already begun to form fresh fibre, and such plants generally retain a healthy appearance. 3d. I

have moved plants of the same batch six feet high, some in November and some in April, with equal care, and those moved in November have languished for years, and in fact never recovered, while those moved in April were completely established in twelve months. So much for experience. Theory is, I know, considered to oppose my view, and this I proceed to examine. It is, I presume, allowed on all hands, that the best season for moving any plant is its period of greatest rest. That period generally occurs when the foliage has nearly completed its allotted term of existence, and is soon about to fall. The Holly sheds its leaf in May and June, at which time also it makes its growth. I believe its period of greatest rest to be in April. The leaf is then nine or ten months old; its tissues are hardened, and its pores nearly closed, and the whole plant full of organizable matter. Its roots are already in active exercise preparatory to the next season's growth of wood, just as the roots of a Crocus make considerable growth before the foliage puts forth. Now if you move a Holly at that season, you generally accelerate the fall of its leaf, and in about two months the plant is covered with new wood, which carries on the renewed action of the roots. The theory of moving Hollies in November is, I believe, that the moist atmosphere of that season prevents exhaustion by the pores of the leaf. This is no doubt true, but the Holly is then in the midst of its growth; its tissues are still soft; its pores large and open; its leaves not more than four months old. The check given to it by removal is so severe that it cannot get over it. It does not make fresh root, for want of stimulus, for light and heat are failing, and the excitability of the plant is partially exhausted. It does not wither, from the absence of evaporation; it has not even vigour enough to shed its leaves, and so restore its equilibrium; but it stands still with gaping pores and mutilated roots till March winds destroy its fallacious appearance of health. The Holly has been a special favourite with me from childhood, and I often recommend its cultivation, and almost invariably receive in reply an objection founded on its slow growth. Now my own experience is that its growth is by no means slow when planted as I recommend. I have planted them with my own hands six inches high, and had them grow upwards of a foot a-year from the time of planting. In conclusion, I invite your readers to test my observations by planting with equal care, in similar situations, a certain number of Hollies in April, and a like number in November, and to watch the result; and I venture to predict they will never plant again in November. I might allege the frequent inquiries on this point which appear in

the *Chronicle* as a proof that the prevailing practice is unsatisfactory. If your readers found autumn planted Hollies flourish, they would not so incessantly inquire what is the best season for planting.—*Gardener's Chron.*

THE OTAHEITE ORANGE.—This shrub is very dwarf and compact in its habit of growth, rarely exceeding eighteen inches in height, has rather small leaves, and very short-jointed wood. When in flower, it is one of the prettiest objects imaginable, independent of the fragrance of the flowers; and as it bears fruit abundantly, which are very sweet, it is always an interesting object. It is as easily grown as the commonest greenhouse plant, and can be forced into bloom at any season. It is one of the most suitable plants that I know for the drawing-room. I have seen it flower most profusely, and fruit most abundantly, in a conservatory in the west end of London, which, I think, is a sufficient guarantee it will require but little care in the country.—*Gardener's Journal.*

POTATOES FROM CUTTINGS.—In the spring of 1846, when the alarm of disease in the potatoes was very rife, I referred to some old agricultural tracts, with the hope of gathering a few hints that might tend to alleviate the forthcoming distress of scarcity in this valuable root. Finding in one of them a remark that led to the idea that a crop of potatoes might be produced from cuttings, I was struck with the singularity of the suggestion, and I determined to make an experiment agreeably thereto; and, though it was then the middle of May, I considered that, even then, cuttings from the rows then growing (planted in March) might, if soon dibbled in, be successful. I therefore had ground dug up sufficient to plant about fifty yards running in rows alongside the then growing rows, which were now from twelve to fourteen or fifteen inches high, and tolerably bushy and strong. From these growing rows, I caused to be cut off (about the 10th of June) the strongest of their leaders or branches, so as to be about eight or ten inches in length, and they were immediately dibbled in singly, as cabbage plants are, the dibble pressing some of the earth lightly against the plants, which were then well watered. They drooped for two or three days, as cabbage plants do; but, being well watered morn and eve, they began to look up the fourth or fifth day; and then showed, on examination, that they had begun to strike very fine fibrous roots, and appeared very promising. Then followed earthing up; and in August they began to be vigorous rows of most healthy plants, and the roots were found to be forming small tubers, and these new rows were nearly as high as the old ones. The result was, that in the middle of October,

1846, both the old and new rows were dug up; and, save that the old ones had more large tainted potatoes than the new ones, there was little or no difference in size; and, in respect to weight, the old rows produced very little more than the new ones. I trust I shall not be thought over-sanguine in recommending this plan, when I remark that, first, the poor man, by adopting it, will save one-half of his stock potatoes now usually planted by him in March; secondly, that the community will have distributed one-half of the potatoes usually planted in March throughout the kingdom, which may be applied for food; and, thirdly, that the industrious cottager will have the opportunity of growing crops of winter and early vegetables for full two spring months on half the land he has hitherto taken for his potato crop in March.—*Ibid.*

GAS TAR WALKS.—The manner of forming walks of gas tar is very simple. You must first fill up the walk nearly as high as it is required with firm and durable materials, as a foundation; the surface of this, which should be of materials which are tolerably fine, should be made quite even, and of the curve required. Then apply the tar in a heated state, so as to cover every part thinly and evenly; over this spread a layer of sifted dry lime rubbish, or old mortar, applying as much as the tar will absorb. When this is pressed down, add another layer of tar, and sifted mortar, and on the surface, coarse, gritty sand: as much of these dry materials must be added as the tar will absorb, and the whole must be pressed down firm with the roller. They may be made at any time, but are best done when the surface is tolerably dry.—*Ibid.*

THE FILTERING OF WATER.—This operation clears water of all earthy and other solid impurities, and there are many ways of doing this, because from plain sand to the true filtering stone, almost any clean medium will stop the foulness from going through with the liquid; but we have never seen a more complete filterer than that produced by Mr. Day, of Rotherhithe, which operates rapidly and effectively. We do not know that the ordinary impurities of river water, or even pond and stagnant water, would prove injurious to plants, and sometimes vegetable foulness might have a contrary effect, and afford extra nourishment; yet, if we had choice plants, and doubtful, we would rather filter it than use it without. For culinary and drinking purposes there can be no doubt of its value, and we can always supply the nourishment required in the soil, for the most delicate or the most robust plants, when the water applied is void of all adventitious mixture.—*G.*



THE GERANIUM, AND ITS CULTURE.

BY GEORGE GLENNY.

ENOUGH, in all conscience, has been written upon the subject of this favourite flower, and yet we must write once more. One would, however, think, that every cottage window was in itself a lesson, when we see the rude health and fine colour which characterize almost every plant we see in those situations. The truth is, that persons who grow plants for amusement only, are content with ordinary loam and dung, or even the common mould from a kitchen garden, and as they do not excite the plants, they remain in health, while others, who grow for exhibition, mix up excitable compost, which makes the plants grow very strong, but in this very strength there is danger. A slight check deranges their machinery, or, rather, their structure; and whole collections frequently get impaired in the colour of their foliage, and the disappointment is mortifying in the extreme. There is no stalling off the mischief, because it is all too deeply seated before it shows itself, and often past recovery, as fine specimens, before anything wrong is indicated by the appearance. A person should never use exciting composts, unless he is constantly attending to his plants, because the higher they are grown, the more susceptible they are of damage; and *vice versâ*, the more simple the compost, the less likely they are to be deranged in their economy,

although they may not grow quite so rampant and strong. The great object of the cultivator for exhibition, according to the present fashion, should be strength, bushy habit, quantity of bloom, and colour of foliage. This is not to be accomplished by exciting composts, for rapid growth induces long instead of short joints, and nothing goes farther towards spoiling habit. Suppose the sticks, the scores of sticks, were removed from some of the gay-looking show geraniums, they would hang all over the pots—they having been excited into rapid and weakly growth, and unable to sustain their own weight. There is nothing so much wanted as a reform in this matter. The waste of time required to prop these miserable branches out at proper distances, can only be tolerated by persons who have no notion of its value. Private establishments do not, in general, produce such specimens; and many who buy at large prices, get dissatisfied with their gardeners for not producing the plants as large and as handsome as those exhibited at the public shows. There is, however, a medium as to compost, and no one ought to go to extremes, except by way of experiment, and that should be with a very few of their plants, and not the best. The compost that does least harm, is vegetable mould and loam; hardly any proportions of these can be mis-

chievous. In short, plants will grow in either of them without much damage to their constitution, although they may affect the first growth; but as we propose to treat of all the different stages of growth, the soil to be used, and every necessary particular, under their various heads, we need only say here, that we wish to see geraniums grown in good health and strength, supporting themselves, instead of being propped up with a hundred sticks, which are destructive to the nature of the flower and plant, discreditable to the gardener, and to the Societies who encourage him; in short, it answers but one purpose, which is filling the tables, and a mass of imperfect blooms, instead of a reasonable quantity of noble flowers, is the result. Nevertheless, it is the fashion, and the prizes are too tempting for gardeners, who are generally ill paid, to resist. In obedience to the mania for such things, we shall be obliged to direct how to spoil as well as how to grow geraniums; but our mind has been always made up to one thing, and we shall pay attention to it as a necessary precaution against the all-absorbing propensity to admire large plants. If the public were shown how grand the flowers come when grown on the leading shoot, without cutting back, or stopping, when only three or four, or, perhaps, half a dozen lateral shoots appear, they would hardly know the same varieties; but if even these lateral shoots are taken off, and the whole strength is thrown into the leader, (which we should do, if we were going to show a single truss of the cut flower,) or, what is, perhaps, the best of all, to allow the leaders and the laterals that come naturally to make their growth, and as soon as the laterals show their buds, to pick them off, which is of great assistance to the main bloom, they would not be quite so fond of the enormous plants, and the victimized flowers, that crowd upon the artificially grown, and still more artificially supported specimens that now occupy their attention at shows, and literally disguise the varieties that are really good. It is quite notorious that a flower is never seen afterwards so good as when it is exhibited with its first bloom; and it is thought by some that the flowers degenerate. Let them stop back a currant-tree, and constantly top the laterals, until they crowd it with comparatively weak shoots, and see if they get the flowers and fruit so large; but it is a strange fancy that, in geraniums, the art of gardening is reversed; instead of pruning out branches, to give light, air, and strength, to those remaining, that the plant may have less than its natural work to do.

THE CULTURE.

Soil.—To do justice to the culture of geraniums, it is necessary to be provided with

several ingredients in their purest state. The first of these, and by far the most important, is the loam, formed by the turf, cut three inches thick, from a loamy pasture, and laid together until the entire vegetable matter is decomposed. To effect this, the turves should be laid grass to grass, and roots to roots, one on the other, till all of them are built into a stack. At the end of one year, this should be chopped down into slices, and thrown into a heap, some person picking out grubs, wire-worms, or other vermin, likely to be injurious to the plant; for it is notorious, that no earth is so full of such as that formed of rotten turves, the roots being in general so great a harbour for both wire-worms and grubs of various kinds. The object of chopping it down in these slices, is to detect them the more easily. When the entire stack is thus chopped to pieces and put into a heap, it should lay another year together, and it will be fit for use; and the heap of compost thus formed will be, as nearly as may be, half loam and half vegetable mould, and this compost would, of itself, grow almost anything. The only possible evil that could be, is retentiveness, or adhesiveness; but, unless the natural loam were very stiff indeed, even this could hardly occur. Provision, however, must be made for further mixture; but it may be necessary to provide for cases in which this compost of rotten turves cannot be had: and in this case, you must provide clean loam, remembering that the top spit of a pasture is always preferable to any other, and that it must not be too stiff. In this case, you ought to prepare even the staple heap so as to be as nearly a substitute for the rotted turf as possible. This may be done by putting a three-inch layer of the loam, and three inches of old cow-dung, and repeating these layers till the heap is as high as you intend to make it. Let this lay a year together, and chop it down, as in the case of turf, throwing it into a heap, to be picked, however, as you proceed, in the same way as before directed. The cow-dung is as nearly a compensation for the decayed vegetable, and the continued dressing that a pasture has from the animals which feed, as can be found, and such a compost will grow almost anything. But it may be necessary to use the plain loam, as you get it, instead of waiting a couple of years for it. In this case, all the other matters used with it must be thoroughly decomposed. Mr. Beck, who has been very successful, forms his staple heap, as we shall call the principal soil already described, by means of a top spit of turfy loam, in alternate layers with the muckings out of a stable, allowed to lie in a heap till the straw is decomposed. There will not, however, for general purposes, be found much difference

in the growing qualities of the three heaps; and a fourth may be made, in the want of having pure loam without the turf being rotted, by putting half loam, one-fourth leaf mould, and one-fourth decomposed dung from an old melon-bed. This should be well mixed and turned over as often as possible before using, and it must be used as a substitute for the other heaps, which we shall, for the sake of being understood, call loam. The other ingredients to provide himself with, are turfy peat, with the vegetable fibre among it, and silver sand. Thus prepared, we will venture to say, we shall be able to do without bone-dust, and other nostrums, which are too commonly proposed to be used, and much to the detriment of a wholesome healthy growth.

BUYING THE PLANTS.

In commencing the culture of geraniums, it is desirable you should, in blooming time, visit the nurseries, and choose for yourself; or attend where you may see a great number prepared for exhibition. We prefer visiting the nurseries, because there are many plants grown that are not barbarized by the degrading use of props; and you are able to see whether a plant is of such a habit as will sustain itself without props; if there be any that will not, do not touch them, nor admit them into your collection. Choose plants of good strong bushy habit, with short strong joints, rich foliage, and compact round-looking flowers, with thick petals, smooth edges, and well-defined colours. They should also be with large trusses of flowers, which have footstalks long enough to spread out the bloom of each truss into a handsome head; regard should also be had to contrasting the colours of the collection, choosing the best of each colour or shade, such as the best pure white without a blotch, the best with a light blotch, and the best with a dark one. Then the best pink with a light, and the best with a dark, and so on, through all the best of the colours. Avoid those that are indefinite, and not bright and striking, for they do no good to a collection. The only exceptions to be made, are when there is any remarkably good point about them unconnected with their colour; for instance, the thickness of petal, or roundness of flower, with smoothness of edge. These points, in perfection, might tempt us to take one of bad colour for the sake of raising better colours with these good qualities. These plants are, for the most part, bought in thumb-pots out of the blooming season, though the old varieties may be had already in flower. We shall treat them as if in four-inch pots, well established, and in the autumn of the year, the time when most new varieties are sent out by Mr. Beck and other seedling growers.

THE FIRST SHIFT.

Get some six-inch pots, and put in a crock at the bottom to cover the hole, and some smaller ones to assist the drainage. Now prepare a compost with two parts from the loam heap and half a part of peat, rub it all through a very coarse sieve that would let a hazel nut through, because it removes any large portions of undecomposed matter, large stones, and hard lumps, while it does not affect that admission of air which is so essential to the roots. If this mixture seems sufficiently light and porous to let the water through very easily, there will be no occasion for any thing else, but if it appears too adhesive, add half a part of silver sand. Mr. Beck uses his two-thirds from the loam heap and one-third of silver sand and peat mixed. The truth is, that neither the peat nor the silver sand is of use except in a mechanical way, to render the soil rather more pervious to air and water than it would be alone, and therefore the use of them must be for the most part dependent on the adhesive or non-adhesive quality of the loam. Turn out the ball from the four-inch pot, and having put a little soil into the larger one, and rubbed off the surface and the drainage, place the plant in the new pot, as low down as the base of the lower shoots or the lower leaves, for a geranium will bear deep potting, and strike new roots all the way up the stem; so that at every shift it may if desirable be set lower to make it more dwarf. If the plant consist of merely the upright cutting, and there are no lateral shoots, pinch out the top if you intend to make it dwarf and bushy; but if you desire to cultivate the plant for a single truss of flower to cut, take out any side shoots that may come, and grow the plant up; but there is a better way than either, if we are to be content with one noble truss and a handsome plant, and that is, to allow it to make its own growth, which will be with one leading shoot and a few lateral branches, which form the plant into a bush at the lower part, while the leader is dependent on for the principal and perhaps only bloom,—the way in which, according to our notion, one class ought always to be exhibited. We would have these classes, one for quantity of bloom, one for cut trusses of bloom, and one for plants with only a single truss of flower; but even the first class should be prevented from showing with props, for we maintain it is not only unnatural, but it has caused the cultivation of many sorts quite incapable of sustaining themselves. Having, however, made the shift from the four-inch to the six-inch, they may be placed in the house to make their growth, which they soon will, and be ready for another

shift. All this time they must have plenty of air, and not too much water. Mr. Beck, whom we are bound to look up to as a cultivator, on account of his excellent productions, recommends us to promote their growing freely until they have rooted well round the pots, then keep them quiet by withholding water as much as possible, and giving them abundance of air. We cannot dispute the propriety of promoting their growing freely, unless we could define the thing, by knowing the means by which they are to be grown freely. We do not consider the necessary growth from the autumn repotting, to the next shift, warrants our acceptance of the words. We, for instance, object to any more heat than is necessary to preserve the house from damp and frost, and we also object to any more water than is necessary to keep them going, and we give as much air as the mildness of weather will enable us to do from the time of the first to the period of the second shift, which with us would be as soon as the roots fairly get round the pots. We suspect that this is the system intended by Mr. Beck, although, for the sake of brevity, he has conveyed to our minds the notion that heat should be applied to promote growing freely. We should merely supply them moderately with moisture, liberally with air, and sparingly and reluctantly with heat. We should shift them as soon as the roots began to meet round the pot.

SECOND SHIFT.

From the six-inch pots we should remove to pots of eight-inch size. Putting crocks at the bottom as before, and using the same compost, we should remove the ball whole from one pot to the other, merely rubbing off any loose soil from the balls, and sinking the plants still lower if necessary, so as to bring down the foliage to the edge of the pot. Of the plants that are to be bushy, any shoots that are more vigorous than the others should be stopped, to promote an even growth. Those intended to grow a single truss for cutting, and the plants of which are not for any other purpose, may have their side shoots taken away as often as they come and as soon as they are large enough. The plants which are to be shown with a single truss on the leader may have any remarkably vigorous side shoots shortened, to prevent them growing ugly or uncouth, and also to check too much exuberance in any one branch. These plants will all be found vigorous, and where they throw up the leader trusses, select from the plants those which have the greatest number of flower buds on the main truss, and put them on one side. The others may bloom all their trusses, and will, though not tortured

into a hundred bunches of insignificant flowers, show eight or ten perhaps as large as any two of the others. As the side shoots develop their blooms in the selected plants, let them be picked off, and allow none but the truss selected to bloom on the same plant. They will not be quite so large as the trusses on the plants deprived of their side shoots, but they will be much larger than any of the others. The selected plants will yield a centre truss but little inferior to them, and those which are all allowed to bloom, will be bold and handsome compared with the plants which are stopped back from time to time, to increase the number of branches and trusses intended to be propped into their places. But these require, as a general application, as soon as the trusses of bloom are formed, liquid cow-dung water, made with one bulk of well-rotted dung to six bulks of water, that is, a quart to six quarts, or a gallon to six gallons; this may be used once to three times watering with plain water, and continued until they bloom once out of four waterings. The cow-dung is stirred with the water, and applied just the same way through a rose of a watering-pot, but not on the foliage.

BLOOMING.

As they approach the opening of the bloom they must be shaded with a very light cloth, and air should be given while the sun is powerful. About five, the house should be closed, and the plants be syringed carefully with a light rose on the syringe, and very clear water. The plants will bloom in perfection; and the difference between the plants pinched back and grown into numerous stems and those only grown into one or a few, will be so striking as to make the flowers appear different varieties. Mr. Beck, who has a great dislike to sticks, but must nevertheless grow according to the rules of exhibitions, directs the sticks to be so placed, and to be of such length, that they cannot be seen above the base of the flower stalks; and he very properly remarks, and it is going part of the road with us, that the truss that will not support itself is unfit for the amateur's stage. We go farther, and maintain that the plant whose branches will not support themselves, is unfit for cultivation or exhibition, though we know many approved varieties are of this faulty nature.

GENERAL MANAGEMENT OF SHOW PLANTS.

The enormous specimens which we occasionally see at exhibitions, are as easily produced as small ones. There is no more merit, although there is more labour. A geranium could be grown as large as a gooseberry bush,

with nothing but additional work, that is caused by the difference of weight.

GROWTH OF LARGE SPECIMENS.

A very simple set of rules decides the number of branches on a geranium, as well as on any other plant of similar habit. By taking away the top from a cutting as soon as it has struck and been potted singly, and down to within three eyes of the ground, these eyes will send forth three branches, and as soon as these have grown so as to have two eyes to leave on, they may be topped; from each of these, two more branches are emitted. This kind of check is to be accompanied by occasional shifts from small to larger pots as soon as the roots fairly reach the side, and begin to meet or grow round the outside: in the course of this treatment it will be found that many branches will come where they are in each other's way; those which would cross or crowd each other must be regulated by taking away the one most in the way, and due regard must be always had to the general form of the plant; but it is quite certain that by this constant plan of shortening the branches as they come forward the form may be adjusted to anything. In all the shifts the plant may be lowered in the pot if necessary, to bring down the foliage to the rim of the pot, for nothing looks worse than a vacancy between the pot and the foliage. It is only necessary to continue this till all the buds begin to rise and bloom, when they may all be picked off, and the plant may have all the air, and sun, and rain; in short, it may be placed in the open garden, where it would be sheltered from high winds. Towards the middle of August it may be deprived of water and cut in, and the branches may be thinned, so as to form a good skeleton of a plant. It may then be repotted. In cutting in the plant, you must recollect that it is to form the foundation of the next year's enlarged growth, and therefore it requires thinning as well as cutting back. You have to make allowance for a new and fresh growth from the old wood. As the plants will require all the air they can have safely, it is better to remove them to a pit or frame, where they can be left wholly uncovered when necessary, and be kept from cold, excess of wet, high wind, and the very hot and bright sun. As soon as there is any danger of frost they must be removed to the greenhouse, and abundant room must be given to the plants, to prevent them being drawn up. As the new growth comes you must rub off the shoots that are in each other's way, and stop any that are growing too vigorously, for the great object is to preserve a uniformity in the growth, and if any shoot or shoots take to growing faster than

the rest, the discrepancy would be increased as the plant advanced. As soon as the shoots attain a length sufficient to leave two good joints, the tops may be taken off, and the plant may undergo the same treatment in every respect that is given to the younger ones. The abundance of shoots will enable you to choose which you leave on; and by occasionally examining them, and taking off the superfluous growth, the plants will become as handsome on a large scale as the smaller ones; but to follow the fashion of the day, you will be forced to place short sticks to the branches, so as to regulate the flowers, which would otherwise be thick in some places and thin in others; whereas it is considered necessary to have them constrained with a little gentle violence if required, so as to be at pretty nearly equal distances all over the plant alike. It ought to be mentioned, that by the beginning of April the pots will be full of roots, and that, large as the pots may be, these enormous plants will require a further shift; and the only difficulty there is to encounter is in lifting about and handling such cumbrous and weighty subjects.

TEMPERATURE.

The geranium should not be subject to checks and changes. In winter time the skill of the gardener is tried most, for there is no little difficulty in regulating the temperature so as to keep out frost without the house being at times too warm. It would be well if the temperature never exceeded 40° of a night and 50° by day; but this is too often reversed. The usual plan is to let them take their chance by day, if there is no frost, and to light fires in the evening, by which the temperature of the house is raised in the dark and lowered by daylight. In summer time, it is true, the sun raises the temperature by day; but the geranium makes its growth all the winter, when for weeks together we have no sun shining upon the house. The expense of firing is, we suspect, the ruling influence; and if not altogether so, the trouble regulates the rest; but certain it is that no man lights a fire if he can help it. With geraniums it is desirable to avoid fire heat altogether as much as it is possible; but so slight a frost is fatal to this plant, that a man dare not risk it in the night, when the glass is getting down too near the freezing point by day; but it would be far better to use fire by day, so as to warm the house, and let the closing suffice for all the early parts of the night, than keep them very cool all the day and light fires at night. In the culture of these plants it is worth while to have a rolling cloth to come down the glass to the brick-work, so that it may be let down in the evening, instead of

lighting fires, for it keeps in the natural warmth many hours, and if attended to at night, and at all times when frost is indicated, the plants would be saved from the necessity of fires, and be all the stronger and better for it. At the same time it must always be borne in mind, that thirty-two is the freezing point, at which they take great damage, if they are not killed outright, and therefore that regard must be had to the prevention of too near an approach to that, either by covering or gentle fires, begun, however, in the morning, and not at night; so also provision must be made that the artificial heat does not raise the temperature above 45° by night at the most.

NECESSITY OF ROOM AND VENTILATION.

Few people who have not paid attention to the subject, are aware of the necessity of giving the plants room; many crowd the pots together so closely that the plants all but touch each other. There is hardly anything more detrimental to their general health. It is true, they live, and bloom, and, to ordinary observers, appear very pretty; but place one of them by the side of a truly healthy plant, and you will observe such a contrast as to excite astonishment; the foliage paler, the leaves smaller, the stems slighter and weaker altogether, the flowers thin and distorted; such are the fruits of keeping plants too close together. There ought to be as much room between one plant and another as half the diameter of the plant, that light and air may not be impeded, but the entire plant be open to the influence of both; nothing should induce a grower to crowd them, for it is better to throw half away, and grow the other half well, than to spoil all.

FUMIGATING THE PLANTS.

There is no positive rule for this; it should be done frequently, without waiting for the appearance of the aphides, for when they come it is too late; mischief is done in a short time by the green fly, even before it can be noticed, except with strict examination. The best mode of fumigating is with coarse strong tobacco, in proper fumigating bellows; but it can also be done with some hot charcoal in a flower-pot, and putting the tobacco in it; or by putting the nozzle of the common bellows to a hole in the side of a flower-pot, such as are made in many pots for extra drainage, and so blowing the lighted tobacco. The smoke must fill the house completely, even to the ground, which it touches last. The gardener may operate very well till the smoke fills the upper part down to his head; he may then sit down, and puff again until it reaches him so much lower; and he

may kneel, and at length lay down, and find no quantity of smoke next the ground. However, the most complete way is to have a hole in the door, through which the nozzle of the fumigating bellows may be put, and they can be worked from the outside without the slightest inconvenience. Care should be taken not to overdo it. It may be easily seen when the house is properly filled with smoke. The next morning they should be syringed with a fine rose. Some fumigate once a month; others very closely examine for the green-fly, so that one could hardly escape them, and only fumigate when they discover them; it is, however, indispensable that they get well smoked when the buds show, and before they bloom, however much or little they may have been attended to in this particular before.

WATERING.

All plants should be watered with liquid of the same temperature as the house they are in. Those who are economical collect all the rain-water from the roofs of their houses, and convey it into tanks within the building, for rain water is far better than all other, and river water is next; but thousands of plants are destroyed in health by the application of spring water from wells. When you are obliged to use spring water, it [ought to be exposed to the sun for days in shallow vessels; but it is far better to avoid it, if possible, and to economize the rain water as the best possible way of providing a proper moisture for plants of all sorts. The geraniums do not like too much wet; they had better temporarily flag than have moisture when they do not want it, for an excess causes the leaves to turn colour and to fall, and even the best of the leaves to be spotted with a sort of mildew, much after the manner of carnations, when they get the damp; examine them well, therefore, before you water, and convince yourself they require it before you give it them.

CUTTING IN AND STRIKING CUTTINGS.

Geraniums in healthy growth, and particularly when they are being grown for exhibitions, can always spare cuttings; for what with stopping the branches and thinning out the lateral shoots when too crowded, there is never any want of cuttings if we wish to propagate; but there is a period for cutting in all plants without necessarily forming monsters, as we have already described. When they have done blooming, and, if necessary, done seeding, let the plants have no more water for some days, and when the soil is pretty dry, cut them in closer than we directed for the monster plants; in fact, they should

be cut in so close as to allow of only sufficient eyes to form a new moderate-sized plant next year. They should then be kept dry a few days, to heal their wounds, and afterwards trimmed at the roots; all the matted fibres removed, and even the strong roots cut back a little, and the plants, so trimmed, repotted in much smaller pots. These may be shut up close in a frame a few days, but bottom heat, if it can be had, hastens the making of new roots, when they may be preserved through the winter as we have already described. The cuttings from these plants may be struck almost like weeds; the shortest joint will make a plant, and it is only necessary to cut the stem at bottom, close to the base of a leaf, and place it in the soil with one joint above; nay, the geranium strikes so freely, that if it answered any good purpose they will grow from eyes like the grape vine. Pots full of these cuttings may be covered with bell glasses; or the space that a hand-glass would cover may be stuck full of them on the common border: they may be rapidly struck in a gentle common hot-bed, but it would be more difficult to prevent their striking than to strike them, place them in soil where you can or where you will. In the ordinary way they will strike under a month; but, assisted with bottom heat and close covering, they will root in ten or twelve days. They are then potted in sixty-sized pots, and watered and attended till they are ready to send out, or kept till they have thoroughly rooted round the pots.

RAISING FROM SEED.

The proper choice of seedling plants must be made according to what you want; half a dozen of the best varieties may be planted out in the open air in May, when the weather is settled, and where no others are near; or they may be inoculated with any sorts you wish to work from for improvements. For instance, you take well-shaped thick-petalled flowers to seed from; take out all the anthers as soon as you can get hold of them, and when the pistil becomes glutinous take the anthers from some flower with a good quality that you wish to obtain on thick-petalled flowers, and put the dust on the pistil of those you are to seed from. The most easy method of conveying the powder from the anthers of a flower is on a camel's-hair pencil; but it is the same thing in effect if you take the flower and touch the pistil of the seedling plant with the anthers, for enough powder is sure to leave the anthers and attach itself to the pistil to answer all the purposes of fertilization. The plants to be seeded will need little or no care, unless they have to be covered in very stormy weather. The truss may be gathered when the seed is nearly ripe; and by hanging

it up, or laying it down in the sun, it will ripen, and the seed must be looked after if any of it escapes; to prevent this, however, as it dries, it is well to put it in shallow boxes or drawers to dry. This seed may be sown in the spring, in wide-mouthed pots of soil such as we have recommended for general culture. The seeds should be sown thinly, so as not to crowd each other, because you are quite as likely to waste a good one as a bad one in the event of losing any; place it in the greenhouse, or, if you like to hasten it, you may raise it on a hot-bed; but where the geraniums are preparing for bloom, and the temperature is moderate, will do very well. Place a bell glass over the seeds till they vegetate, when they may have air, which you can give by uncovering them. As soon as they are up and large enough to take hold of, prick them out an inch apart in other large pots, for a great body of earth is far less liable to changes than a small one, and therefore there is less danger of their suffering from dryness. Here they may keep growing until they begin to be crowded, when they may be put into sixty-sized pots, well drained, and filled with the compost recommended for the ordinary culture. When these pots are filled with roots, change them to forty-eight-sized pots, and from them, as soon as necessary, to size thirty-two, in which they may bloom, when you give away, or throw away all that are not better than you possess already; and if you cannot do this very readily, cut off all the blooms, to prevent their spoiling any seed that may be disposed to set on the best of the flowers in the collection. For all the good they are, they may be turned into the open air, or into frames; or, if you have a house devoted to seedlings, and there are but few good out of a large number, the good ones may be removed to another house, and those which are of no other use may be left in the place they occupy, to use for cut flowers, as people are not hypercritical as to the forms of a geranium in a bouquet. When a seedling is found very good, so that there is no doubt about eventually naming and propagating it, the sooner all the spare pieces can be taken off and struck, the better, because cuttings struck early become plants in time to propagate from again; and from a single cutting taken in April or May many others can be obtained before the autumn; while the original plant, denuded of some of its branches, pushes into fresh growth, and affords the means of rapidly increasing the variety.

PROPERTIES OF THE GERANIUM OR PELARGONIUM.

1. The petals should be thick, broad, blunt, and smooth at the edges, and slightly cupped.

2. The flower should be circular, higher at the edges than in the centre (so as to form rather a hollow, though by no means a deeply cupped bloom), without puckering or frilling; and where the petals lap over each other, the indentation caused by the join should be hardly perceptible.

3. The petals should lie close on each other, so as to appear a whole flower rather than a five-petalled flower.

4. The stem should be straight, strong, elastic, carrying the blooms well above the foliage. The footstalks of the individual flowers should be stiff, and of sufficient length to allow the flowers to show themselves in an even head, fitting compactly edge to edge, and forming a uniform bold truss.

5. The colour should be bright and dense, whether it be scarlet, crimson, rose colour, purple, lilac, or any of the modifications; the spots on the upper petals should be boldly contrasted with the ground, and the darker the better: both upper petals should be alike, both side petals alike, and the lower petal uniform.

6. All white grounds should be very pure; and the colours, no matter what they be, on the white, should be decided, well defined, and by no means flush into the white.

7. The spots on the upper petals, or the marks in any other, should not break through to the edge.

8. Colours being a matter of taste, do not affect the real properties so much as other points, unless it be on the score of novelty; on this ground a bright scarlet would be desirable, and a black spot. We have plenty of approaches to both, but none very near.

9. The plant should be shrubby in its habit, the foliage close, and of a rich bright green, the joints short and strong, able to support themselves in every part without assistance. The flower should be large, not less than five in a truss, and come at the end of every shoot.

The obvious faults of most geraniums are, long and pointed lower petals; uneven, twisted, notched, or puckered edges; long footstalks, which make the truss loose and open; weak shoots, and stalks that will not hold up the flowers without propping, which destroys the appearance of the plant altogether; small leaves and long joints, which make the plant open, the habit gawky, and the foliage poor.

The Societies which intend to encourage the geranium should give prizes for plants only one year old, from cuttings, require only one truss of bloom, but allow as many as any body likes to grow; consider none to be trusses which have less than five blooms, require all to be shown in thirty-two-sized pots, and have the nurserymen's class twelve, amateurs' six; allow a class open to every body for single

plants and seedlings, in which only one truss shall be allowed to the plant, and the seedlings should compete with the named flowers; and, as is the case with the auricula, allow no support of any kind whatever.

With regard to large specimens, the reader may take our word for one fact—not one of the trusses out of the hundreds exhibited will be found so good as it ought to be; and though they make, under the present rules of showing, a great staring object, they have not a solitary merit that should engage the attention of the gardener, the man of taste, or the man of business. The gardener ought never to be employed on such effeminate work, as placing a hundred sticks to a geranium; the man of taste would despise it when it was done; and the man of business would view it as a waste of time and labour.

MONTHLY TREATMENT.

JANUARY.—Examine the roots, to see if they reach the sides of the pots, and begin to mat at all, in which case they must be removed to pots a size larger. The principal care required is to protect the plants against frost. Avoid fire heat as much as practicable, and give all the air you can in mild weather. Plants intended to be bushy for show, and therefore which have numerous shoots, must be examined; any branches that grow too vigorously for the rest must be cut back, or at least stopped. Seedlings are not to be topped nor thinned, but are to be allowed to grow as they will, with only occasional shifting as they fill their pots with roots. If the weather be muggy and cloudy, put a little fire in, and open the tops of the lights a little. This is requisite to dry the house.

FEBRUARY.—The last shift before blooming should be given this month. We should make no difference in the soil for the last shift. The cuttings of last year, if well grown for bushy plants, ought to be fit for eight-inch pots, which are twenty-fours; and the two-year old plants that were cut back and begun in smaller pots again, would occupy nine-inch pots, or sixteens. Plants grown for size as large specimens may be requiring extra sizes, even ten, twelve, or fourteen-inch pots, which last are only two to the cast. Those who grow seedlings in great numbers may bloom them in the small pots, or forty-eights, to which they were shifted from the sixties; only, if they do, they must be constantly watched, that they do not get starved for want of moisture, and have liquid manure every fourth watering; nevertheless, they ought to be shifted to thirty-twos if room can be made for the increase. Prop out the branches into their places if you are growing upon this system, though we object to it.

MARCH.—See well to the plants and watch closely for the green-fly ; or take the trouble to fumigate without watching. Protect as before against frost, and in mild weather give air, particularly if the sun be powerful. The plants should be syringed all over and shut up in the evening. At the end of this month, or the beginning of next, you may sow seed, and place it in the greenhouse ; and if you are obliged to use fire-heat to keep out frost, occasionally water the ground of the house to keep the atmosphere from becoming too dry. The watering of the plants must be attended to, not by periodical applications, but after convincing yourself they require it ; and one watering out of four may be with liquid manure, cow-dung and water, as described before. The tying up and propping out of the shoots which have bloom-buds on them occupy the attention of exhibitors upon that plan, but a rational cultivator will consider well before he fools away so much time in spoiling an otherwise elegant plant fully capable of supporting itself in its natural growth.

MAY.—The advancing blooms now require shading. This, if not done by means of a rolling blind on the roof, must be accomplished by a blind on the inside. Thin calico will answer the purpose, fastened, as to position, on the same slope as the glass, and if three or four inches from it so much the better. Examine the seedlings daily to observe what are fit for immediate propagation, and which are good for nothing. Give as much air as can be given to all the plants ; but it must be given judiciously, and not so that the wind may blow the flowers about, or cover them with dust. It is requisite, if the flies and bees annoy you in the house, to keep them from the plants by means of muslin curtains or blinds covering the places where the air is admitted. A very coarse open muslin is to be had adapted for this purpose. If these insects be not repelled they will fertilize the flowers by spreading about the pollen ; and the result of this is a rapid decline of the bloom. Seedlings that are large enough may be pricked out an inch apart in wide-mouthed pots. Sow any seed that may remain out.

JUNE.—Continue the May management, but as soon as any plant has passed its bloom, let it be put out of the house in a somewhat sheltered place to ripen its wood, to be reduced in size and repotted, or pruned, to make a larger plant next season ; or cut to pieces for increase ; or to seed, as the case may be. Seedlings are still opening and want looking to as before. The seedlings not yet pricked out may be put out now, but it is an operation that should always be performed as soon as they are large enough to handle ; and they

should be potted off into sixty-sized pots as soon as they have grown large enough to touch each other in their store pots. Cuttings may be taken from any plants required to be propagated, and struck in a pot under a bell glass, with or without bottom heat. Fertilize any flowers you are anxious about.

JULY.—In many respects the treatment assimilates to June, except that there are very few plants in flower, and a good many past it ; instead of many in bloom, and a few past it. Pot any seedlings that are large enough. Give air and water to all in store pots or seed pots. Pot off any early cuttings that may have been struck. Cut in towards the end of the month all the plants, and put the cuttings in an open border, under a common hand-glass ; all they will require is to shade them from the powerful mid-day sun, and give them abundance of water. Let the old plants be kept dry till they have healed their wounds.

AUGUST.—Continue the July operations. Watch the plants that are seeding, that the pods may be gathered before the seed disperses. Pot off the cuttings struck last month, and shut them up a day or two. After watering them they require to be shut out from the air until they have settled ; after which they may be kept in any pit, frame, or house, until established fit for sending out. Shake out the mould and trim the roots of the old plants, so as to pot them in smaller sized pots than they were bloomed in, and keep them from the air two or three days.

SEPTEMBER.—Shift the young plants into forty-eight-sized pots. Take the tops off to make them bushy, or keep them on if they are to be grown naturally, and they will be right for a single truss, or for a moderate number, whichever is required. See that you gather seed as it ripens, and before it is lost. Finish repotting any old plants that are to be removed into smaller pots to grow again, though many throw away the old plants of very common sorts. Complete potting all the seedlings. Look well to watering all recently potted plants, as they are apt to suffer a good deal more than established plants.

OCTOBER.—All the plants should now be placed in winter quarters, whether it be a house on purpose, or an ordinary greenhouse. Let them have room, above all things. Shift any that require it from having filled their pots with roots. Observe the practice of last month as to the topping of those that are to be bushy, and to bloom abundantly rather than finely ; others, which are to take their natural course, or be bloomed up to only one truss, need no other care than to stop any side branch that is growing too vigorously for the

remainder of the plant. Let the plants in general have all the air that the weather will permit. But regard must be had to the occasional frosts which come in the night, or at an early hour in the morning, and the plants must be protected accordingly.

NOVEMBER.—Continue the treatment for October in all respects, watching, however, for the green-fly, and fumigating when necessary.

DECEMBER.—Many of the vigorously-growing young plants and seedlings will now be found to have filled their pots with roots; these must be shifted into others of a larger size; and in other respects the treatment of the two former months will be necessary.

USEFUL SHOW GERANIUMS.

BECK'S Bacchus, Shiner, Patrician, Hebe's Lip, Compactum, Pacha, Dobsonii, Effect, Favoni, Gem, Precision, Arabella, Desdemona, Rosy Circle, Isabella, Mustee, Othello, Aurora, Competitor, Resplendent, Centurion, Cruenta, Cavalier, Cassandra, Gulielma, Gustavus, Honora, Rosamond, and, as a novel fancy flower, Harlequin.

FOSTER'S Orion, Ardens, Erectum, Matilda, Sylph, Ariel, Celia, Armida, Pericles, Painted Lady, Paragon, Satellite.

GAINES'S Princess Olga, Mary Queen of Scots, Lord Hardinge, Admiration, Pre-eminent, Alarum, Chieftain, Lady Kitty, Iago, Peri, Royal Purple, Mrs. Brock, Model, Rising Sun.

LYNE'S Queen of Beauties, Fire-fly, Forget-me-Not, Nourmahal.

HOYLE'S Sunset, Exquisite, Mount Etna, Heidos, Lord Stanley, Abd-el-Kader, Flora's Flag, Governor-General, President.

CATLEIGH'S Pearl, La Polka, and Olio.

COCK'S Melpomene.

MILLER'S Volgius, and Distinctus.

REMARKS.

Short jointed varieties are better than long ones at all times, if the flowers are equal in merit; and very lanky growing sorts ought to be thrown away, unless there be something of extraordinary merit in the flower; in which case the variety may be kept to fertilize those of a better habit. The best way to manage those of an ugly tall habit is to grow them in loam without dung, and stunt them by starvation until they show flower-buds, when they may be shifted into larger pots and the usual soil, as the joints will not lengthen, and it will enlarge their flowers. We are presuming that in all respects but the starving, the treatment is the same as others.

One of the objections we have to the system of showing at the present time is, that the multiplicity of bloom alters the very character of the flower, and this even to the extent of narrowing the petals; so that a lady or gentleman who sees a seedling flower, and orders it for its beauty, never sees the flower so good again if they grow after the present fashion. The reason is obvious—the seedling plant has only to carry two or three blooms, and is never stopped back and grown weakly to ensure a number: and when a plant is checked repeatedly to make it break into a vast number of branches and blooms, all of them have to be supported from the same root. The same thing would occur with pinks, carnations, picotees, pæonias, or any other flower, if they were allowed to bloom as abundantly. Geraniums will never be shown in perfection until they are shown with a single truss.

The geranium was among those flowers whose properties were totally unexplained long after the flower was a favourite, and when colour and mere difference from what we had, were all that seemed to be required for a new-named variety. When the properties were published, and every body knew what would constitute perfection, the flower improved rapidly; and though it was impossible to prevent dealers from putting forth very bad things with very good characters, it was just as impossible to make people order from a blooming specimen anything that did not in some way approach the standard. Some people laid great stress on the blotch, others on the colour, but, from the instant the properties were published, all were obliged to admit the necessity of obtaining the form.

Hill, of Hammersmith, was the first really good grower of the geranium among nurserymen; and Mr. Weltze, of the same place, was by far the best cultivator among amateurs. Both of these growers produced remarkably strong healthy plants without props. Neither of them condescended to use mechanical contrivances to prepare a plant for show; and the death of the one, and the discontinuance of the other to grow them at all, left the new school for props unopposed. Judges at shows countenanced the popular trick of tying up every bloom at equal distances, and of course the thing gained ground. A few amateurs are now starting up who are determined to exhibit their natural grown plants in opposition to the artificially-supported specimens so generally shown; and we hope the judges will have some regard to the real merit of producing the plant in natural form, and exhibiting with unnatural supporters.

If the seeds of the geranium are sown as soon as they ripen in the summer, the seedlings will bloom early the following year.



CERATOSTEMA LONGIFLORUM.

CERATOSTEMA LONGIFLORUM, Lindley (long-flowered Horn-berry).—Vacciniaceæ.

Of this plant we have no knowledge except what is conveyed in the brief statement published in the *Gardeners' Chronicle*, in company with a woodcut representation, from which our own figure was derived.

It is described as a small evergreen shrub, with hairy branches, and small leathery, oblong, sessile leaves, which are quite entire, and slightly revolute at the edges. The long trumpet-shaped flowers grow in loose clusters at the ends of the branches, and from their size, being two inches long, must have a very ornamental aspect, if, as there is every reason to expect, the plant will admit of being grown so as to develop them in considerable abundance. The corolla is cylindrical, and sharply five-toothed, and is said to be of a fine rich purple, though, according to Mr. Lobb, it is scarlet. A peculiarity in the appearance of the plant lies in the stamens, the anthers being furnished with two longish horns, the points of which protrude a little beyond the tube of the corolla. This peculiarity—that of the anthers being furnished with horn-like appendages—is not confined to the plant under consideration, but attaches to the whole order, though, from their being much developed in the present genus, they seem to have sug-

gested the generic term applied to them. The English term Hornberry is given as an equivalent in its signification to the generic name *Ceratostema*.

It is a Peruvian plant; indeed, all the known species of *Ceratostema* are natives of Peru. The present was found by Mr. W. Lobb, in some of the mountainous parts of the country, at an elevation of 12,000 feet, growing in company with *Thibaudia microphylla*. Seeds collected by Mr. Lobb, and forwarded to Messrs. Veitch, of Exeter, have produced plants, so that its cultivation may be soon put to the test of practical experiment.

It is to be regarded as a charming evergreen shrub, suitable for the greenhouse or conservatory; indeed, it has been said to be "one of the very prettiest of evergreen shrubs," and is considered as the finest of the genus. It will probably succeed well in company with *Camellias* and *Indian Azaleas*.

We presume it to be a plant requiring to be grown in peat earth, and to have the pots in which it is grown well and carefully drained of superfluous water; and we should further suppose it undesirable to overshift it, especially while young, and in an unestablished condition. Propagation will be most likely to be effected by means of layering, or, perhaps, by cuttings, or seeds.

ROSES, AND THEIR NOVELTIES.

THE ugliest rose that ever found its way into a garden, is a pretty object, and therefore it is difficult to persuade anybody to discard one; but there is no Florist's flower into whose lists so much really worthless stuff has been admitted, as in roses. Variety is charm enough to admit a thing as common as a dog-rose into the list of novelties, and until florists take to showing them as dahlias, pinks, ranunculuses, and other cut blooms, are exhibited, there will be no actual weeding out of the hundreds which have not the slightest claim to a place in the garden that contains a cabbage-rose with which to compare them. We have been over some of the prettiest rosariums in England; we have seen the finest pillars, festoons, and devices, formed of the climbing and thin sorts, and have been grieved to see the paltry varieties of which these works of labour and time have been composed—flowers without a solitary claim to the distinction of a place in a respectable parterre. Gay for a moment, scattered to the winds the next, flimsy as tissue-paper, and killed by an hour's sun, the flowers are no sooner open than falling about, keeping the very garden they occupy in a constant litter, and looking, if the plant has been three hours in bloom, every way untidy. Such is the character of a great majority of the climbing roses. By grasping at numbers of sorts, instead of numbers of each of only the best sorts, people are wilfully supplied with many more bad than good ones; for such has been the absence of anything like taste in the chief rose dealers, that so long as they could find some trumpery distinction in the colour, or shape, or foliage, or habit of the plant, they would give it a name, place it in their catalogues, describe it as something worth notice, and the enthusiasts of rose growers must, of course, buy. We are sorry to say that, so long as it requires a very considerable number to supply all the simpletons, so long will rose-raisers put forth the most paltry and worthless things at novelty price.

The properties of the rose consist of form, habit, firmness, perfume; and the characteristics which form the class, such as in a moss-rose its moss, in a climbing rose its growth, and so on; but there is no possible excuse for cultivating a variety which has none of these qualities so high as those already in cultivation. The roses that have been added in great numbers to collections already grown, have been in the proportion of ten worse than we already possessed, for one that was as good, or better; and so the rose gardeners, as we may call them, of France and England, for there is no choice, have been making their

fortunes by a constant attack on the purses of the amateur growers. For one garden rose better than the old cabbage-rose, we have a hundred worse. For one moss-rose better than our oldest favourite—on recollecting ourselves, there is not one moss-rose so good, even out of the scores that have been turned out; but we can pardon the adoption of a new rose if it have any one very distinct good new feature. A moss rose of another colour is pardonable, even if worse, but we have scores of roses, only semi-double, without any compensating quality, and hundreds without any distinction, except their inferiority. There is now the rose season before us; the principal nurserymen in the general way are far better to apply to than the rose monopolists, for they have begun growing and selling roses the last few years without making any fuss about it, and knowing that they only meant to have a limited collection, they have wisely chosen about a hundred of the best out of the thousands that have been from time to time offered. We have heard Mr. Bircham, of the Headenham Rosary, Bungay, say, that he had expended hundreds of pounds to buy thousands of varieties, throwing away the great bulk, and retaining only such as are tolerable; and we believe he has not been able to save more than a hundred varieties that he will even recommend to the most enthusiastic grower. An amateur ought never to have two roses of one colour and habit, because he gains no point by it; one must be worse than the other, and he had better have two of the best, than one worse than the other.

We strongly recommend those who grow roses, to look among them and discard those miserably thin-petalled sorts that will not bear the sun and wind; be content with one-tenth of the number of varieties, but have them all good; and above all, buy none without having seen them in flower. We have seen some of the collections of which the choice was left with the dealer, and the selection has been scandalous. It is very natural to suppose that they will always choose from those they can best spare. The descriptions in the four leading Rose Catalogues are abominably false, and we wonder how a party pretending to respectability could put forth such untrue, such widely-stretched misrepresentations. Some are represented as good show-roses, that are shamefully bad, and ought not to be grown at all; others are called everything that is good, when there is scarcely one quality deserving the praise. This is an unpopular side of the question, we know, but as we have published the properties of the rose, so that nobody can dispute them, nor mistake them, we are obliged to be consistent, and strongly

to recommend our readers to buy none till they have seen them, unless the rose-grower will guarantee that they are—

Very double, and tolerably round;

Very thick in the petals, and smooth-edged;

Different from each other in size or colour.

This warranting will place the dealer in the slight difficulty of confining his selection within narrowed limits; but nurserymen have already, in most instances, confined their varieties to

such as have the above qualities; and they will, in serving 50 or a 100 rose-trees, prefer sending ten or a dozen of the best sorts, to increasing the number of varieties, and sending some very bad. As the rose-season approaches, the value of this advice will be apparent; meanwhile, depend on one thing, whoever boasts of a large collection of roses, merely admits that he has more bad ones than other people.

NEW FLOWERS AND PLANTS.

CORYANTHES ALBERTINÆ, *Karsten* (Albertini's Coryanth).—*Orchidaceæ* § *Vandæ-Maxillariidæ*.—Another beautiful addition to this singular genus. It is an epiphytal species, with ovate-conical pseudo-bulbs, producing on the top two broadly-lanceolate leaves, a foot and a half in length. The pendent flower-stalk grows from the base of the pseudo-bulbs, and bears a raceme of from five to eight flowers, which are most curiously formed: the upper sepal (the lowest, as the flowers hang,) is rather more than an inch long, oval-lance-shaped; the lateral ones, which stand out like wings, are ear-shaped, falcate at the apex, four inches long, and two inches broad; they are yellow, prettily and evenly marked with clear purple dots: the petals are lance-shaped, similar in colour to the sepals; the lip is the most remarkable part of the flower; it is attached by means of a short arm, of a reddish colour, and is formed of three divisions; the upper like a helmet, or inverted one-sided cup, an inch across, and covered with silky hairs; the next part grooved, these two parts being of a light rose colour, beautifully spotted and sprinkled with cherry red; the third, or lower part, is, in outline, helmet-shaped, with two large roundish lateral lobes, or flaps, and three teeth in the centre, or apex; this is of an intense red colour: the column is white, with a few red spots, and has on each side of the base a horn, which secretes honey, a delicacy much sought by the humming and neetar-birds, as well as the ants. Native of Venezuela, in the Valley of San Esteban, at the foot of the Cumbre de Valenzia, where it was found growing on the branches of the *Persea gratissima*. Introduced to Germany in 1847. Flowers in the autumn? *Culture*.—Requires a hot moist stove; should be planted in an open basket, and suspended from the roof of the orchid-house; propagated by division of the plant.

PRIMULA STUARTII, *Wallich* (Stuart's Primrose).—*Primulaceæ* § *Primulidæ*.—This is a pretty herbaceous perennial, producing a tuft of several large broadly lanceolate sharply serrated leaves, which are shining above, and covered below with a yellowish

mealy farina. The flowers are produced numerous in an umbel, at the top of a scape twelve or fifteen inches high; they are about the size of a shilling, yellow, with an orange stain towards the centre; they are showy, and impart a rich golden glow to their native mountains. Native of Nepal and the Himalaya, at an elevation of 9,000 feet. Introduced in 1845 to the garden of the Caledonian Horticultural Society. Flowers in the summer months. *Culture*.—Hardy, thriving in a cool northern aspect; peat and loam; propagated by division of the plant.

ARISTOLOCHIA ANGUICIDA, *Jacquin* (Snake Birthwort).—*Aristolochiaceæ*.—A slender plant, twining extensively, with distant cordate-acuminate leaves, in the axils of which the singular blossoms are borne. They are inflated, almost white at the base, above which they are funnel-shaped, yellow, with red-brown reticulations, the top being oblique, with a long deflexed tapering lip, transversely streaked with red-brown. Native of Carthage. Introduced in 1845. Flowers in December. The juice of the root is employed to stultify serpents, and, given in large quantities, occasions their death; it is also said that the juice, applied to the recent bite of a serpent, or taken internally, is an infallible cure. *Culture*.—Requires a stove; sandy loam and peat; propagated by cuttings.

STERIPHOMA PARADOXUM, *Endlicher* (paradoxical Steriphoma).—*Capparidaceæ* § *Cappareæ*.—A strikingly handsome shrub, or bushy tree, growing from six to eight feet high, the branches clothed with a pile of short stellate hairs, and having alternate lance-shaped deep-green leaves, from four to six inches long, attached by long stalks. The flowers grow in densely-crowded racemes at the end of the shoots, their stalks being erect, and they bending downwards; they consist of a cup-shaped two-lobed calyx, covered with a rich russet orange-yellow pile; within this are four oblong petals, of a sulphur-yellow, beyond which the stamens, six in number, project as much as two inches, curving upwards. The fruit is borne on a long stalk-like extension of the disk, called the

gynophore, and seems as though projected on a slender arm, two inches from the flower; when ripe, it is of a cylindrical figure, and attains some size. Native of Caraccas (altitude 1 to 2,000 feet). Introduced to Berlin in 1847. Flowers (wild) in April. *Culture*.—Requires a stove, 75 degrees Fahr.; rich loamy soil; propagated by cuttings planted in sand, under bell-glasses, in heat.

ISONANDRA GUTTA, *Hooker* (*Gutta Percha tree*).—*Sapotaceæ*.—A large tree, with fine foliage, but, in other respects, remarkable for its product, the *Gutta Percha* of commerce, which is the concrete milky juice of the trunk. It attains a height of forty feet, and sometimes a diameter of three or four feet. The leaves are alternate, leathery, and obovate, entire on the margin, and gradually narrowing at the base into the petiole; green above, orange shining beneath. The flowers are growing each on a little separate stalk, issuing in fascicles from the axils of the leaves, and assuming a more or less drooping position; they are sub-rotate, with a short tube, and six ovate or elliptic spreading lobes, and around the mouth of the tube are attached twelve prominent stamens; they are succeeded by egg-shaped fruit. Native of the Malay Islands. Introduced in 1847, by Mr. Low, of Clapton. Flowers ———? *Culture*.—Requires a stove; turfy loam and peat; propagated by cuttings planted in sand, under bell-glasses, or by layers.

ALLAMANDA PUBERULA, *var. Gardneri* (Mr. Gardner's *Allamanda*).—*Apocynaceæ* § *Wilughbeia*.—This appears to be the proper name of the plant known in gardens as *A. grandiflora*, under which name it was figured in 1845 in *Paxton's Magazine*. It is a very beautiful plant, of dwarf shrubby habit, not scandent, as are some allied kinds. The younger branches are puberulous, or covered with fine down-like hairs. The leaves are usually ternate, sometimes opposite, leathery, oblong-acute, attenuated at the base, and nearly sessile; they are smooth above, and downy/beneath. The flowers grow four or five together, in terminal cymes; the calyx-lobes are oblong, acute, and smooth, the corolla large, with a slender tube suddenly swelling out into a wide bell-shaped throat, and expanding into five roundish lobes, so that, when spread out, the flowers are nearly four inches across. Native of the province of Piahy, in Brazil. Introduced in 1836, by Mr. Gardner, who sent seeds to Mr. Cunningham, nurseryman, of Edinburgh. Flowers from July to October. *Culture*.—Requires a stove during its growing season; turfy loam and peat; should be cut back annually; propagated by cuttings planted in sand, and placed under glasses in a mild hot-bed.

BEJARIA ÆSTUANS, *Mutis* (glowing *Bejaria*).—*Ericaceæ* § *Rhododendrea*.—One of the finest of the genus, which has hitherto been almost unknown in our gardens. It forms a shrub of from ten to fifteen feet high, with numerous somewhat whorled branches, clothed on the younger parts, as on the flower-stalks and calices, with viscid glandular hairs. The leaves are elliptic, rusty beneath when young, but becoming there downy and glaucous, and smooth and dark green above; they are ciliated with glandular hairs. The flowers are purple, or rose-coloured, and grow in terminal corymbs; they consist of five equal petals of a spatulate figure, overlapping each other, and forming a funnel-like flower, but not united into a tube; the pistil projects considerably. Native of the province of Chachapoyas, and of New Grenada, near Gonzanama. Introduced in 1846, by Mr. W. Lobb, to the Nursery of Messrs. Veitch. Flowers in ———? *Culture*.—Requires a greenhouse; turfy peat soil? propagated most readily by inarching on the *Azalea indica*.

OROTHAMNUS ZEYHERI, *Pappe* (*Zeyher's Orothamnus*).—*Proteaceæ* § *Nucumentaceæ-Proteideæ*.—A very beautiful and curious shrub, growing from six to eight inches high, with erect purplish villous branches, clothed with sessile imbricated elliptic leaves, which are externally convex, and concave within, glabrous, margined with purple, and fringed with coarse hairs. The flower-heads are produced two or three at the end of the branches, and are drooping; the conspicuous part consists of the leaves of the involucre (the part that surrounds the flowers,) which are membranaceous, and petal-like, of a rose-red colour; the exterior leaves are oblong-obovate and obtuse, glabrous within, and on the exterior shaggy with hairs; the interior ones smaller, lance-shaped, and still more shaggy. The flowers themselves are quite inconspicuous. Native of marshy places on the summit of Hottentot's-Holland mountains, at the Cape of Good Hope, where it was flowering in the month of July. It is not yet introduced to England. *Culture*.—It will require a greenhouse; sandy loamy soil, and bountiful supplies of water; propagated by seeds.

MAMMILLARIA CLAVA, *Pfeiffer* (club-shaped *Mammillaria*).—*Cactaceæ* § *Melocactidæ*.—A very pretty species of the dwarf Cacti, of a columnar outline, growing a foot or more high, of a glaucous green colour, and studded over with teat-like tubercles, or mamillæ, which are of a pyramidal form, with bluntly angular sides, densely downy in the axils, each terminated by an areola, or tuft of from eight to eleven straight pale brown spreading spines. At the top of the plant are produced two or three large showy blossoms,

of numerous linear-oblong or subspathulate petals, which are serrated towards the apex, and terminate in a projected point or mucro; the petals are straw coloured, the exterior ones tinged with dull red. Native of Mexico? Introduced about 1845. Flowers in June. *Culture*.—Requires a greenhouse; sandy loam, mixed with old mortar and charcoal; propagated by offsets when produced; these may be induced by cutting off the top of the plant.

ACHIMENES OCELLATA, *Hooker* (eyeleted *Achimenes*).—Gesneraceæ § Gesneræ.—A pretty flowered but rather coarse leaved species. It has small tuberous roots, and erect purple, somewhat hairy, stems, from one to two feet high, with opposite oval-acuminate leaves, of rather large size, coarsely serrated, dark green and wrinkled, and purplish on the under side. The flowers are borne in the axils of the leaves, and are something like those of *A. picta*; they are bright, downy, and of a deep vermilion colour, yellowish beneath, the limb marked with white spots (which become obsolete in age), having a black dot in the centre. It would be a very ornamental plant if the leaves were smaller. Native of the isthmus of Panama, whence roots were sent by Mr. Seemann to the Royal Gardens at Kew. Introduced in 1847. Flowers in winter and spring, and probably at other seasons, according to the time at which growth commences. *Culture*.—Should be started in a stove or hot-bed, and grown in a cool stove temperature till nearly in bloom, and then, if in summer, removed to a greenhouse; if bloomed in the winter it must be kept in a stove; light soil, moderately rich; propagated freely by its tubers.

SIDA INTEGERRIMA, *Hooker* (entire-leaved *Sida*).—Malvaceæ § Sidesæ.—A small tree, fourteen or fifteen feet high, much branched in the upper part, the younger branches being clothed with stellate hairs. The leaves are large, roundish, heart shaped, with an acute point, smooth above, and woolly beneath. The flowers grow in the axils of the upper leaves; they are solitary, rather large, three inches across, and showy, yellow, with a deep orange-coloured spot at the base of each of the broadly ovate-cuneate oblique petals. Native of New Grenada. Introduced many years since, but date unknown. Flowers in May. *Culture*.—Requires a stove; loam and peat; propagated by cuttings placed in a hot-bed.

RESTREPIA ELEGANS, *Karsten* (elegant *Restrepia*).—Orchidaceæ § Malaxæ-Pleurothallidæ.—A small but very pretty orchid, of peculiarly neat aspect. It grows in tufts, with little round short stems, bearing each one leaf at their summit, from the axils of

which leaf issues the short raceme of three to seven flowers. The leaves are small, elliptical, deep green, thick and rigid. The flowers grow on slender stalks, and maintain an almost constant succession; the upper sepal is narrow, terminating in a thickened point, and is marked with three longitudinal red lines; the two lower sepals cohere into an oblong figure, recurved at the apex, deep yellow, delicately spotted with red; the lip is of the same colours, but half the size, and has a little incurved tooth on each side near the base; the petals are small and narrow; the expanded blossoms are about an inch and a half across. Native of Caraccas (altitude 5 to 6,000 feet), growing on the mossy branches of trees in damp shady woods. Introduced to Berlin in 1847. Flowers all the year, especially from December to April. *Culture*.—Requires a stove (66 degrees Fahr.); should be attached to a block of wood; propagated by division of the plant.

EUGENIA MORITZIANA, *Karsten* (*Moritz's Eugenia*).—Myrtaceæ § Myrtæ.—A handsome evergreen shrub, or rather, in its native country, a large tree, growing from eighty to one hundred feet high; it however blooms freely when from two to three feet high. The leaves are opposite, elliptic, rounded at both extremities, and about four inches long, leathery, with pellucid dots, bright green above, and coloured with ochrey powder beneath. The flowers are borne numerously in axillary cymes; in size and appearance resembling those of the common myrtle, very fragrant, and of a white colour. The leaves and fruit have a fine cinnamon perfume, and the wood is much prized by the natives (who call the tree *Guayabo negro*) from its blackish colour. Native of the Andes of Colombia (altitude 5 to 7,000 feet). Flowers there in December. Introduced to Berlin in 1847. *Culture*.—Requires a cool part of the stove; rich loamy soil; propagated by cuttings planted in sand, under bell-glasses, in heat.

PLANTING POTATOES.

As there are many new sorts before the public, and those who do not plant the full extent of their usual or former crops will repent the omission, we think a few hints may be useful with regard to the present candidates for public favour, and the mode and proportions in which they might be judiciously used. There are some kinds that have been out a season or two, but are in such demand, that they are as difficult to procure as if they had not been sent out at all. Others have not been sent out, and it is the price alone that prevents those who plant from purchasing. The first, perhaps, in importance

is Thurston's Conqueror, a handsomely formed thin-skinned potato, of high quality, very solid, heavy, and well flavoured, whose introduction at a public dinner of the Metropolitan Society gave sixty persons an opportunity of tasting them. This potato is very prolific, and, the stock being short, it was announced for sale at six shillings per peck, or a guinea per bushel. It would be unwise to plant this the first year for table, because every bushel that may be grown will be seized upon with avidity at no great reduction of price. All that could be got might be profitably grown for seed potatoes. No potato grower should omit growing a few. Burgess's Prolific is another excellent kind, not much out yet, but well named, inasmuch as a peck has produced four sacks. This is an excellent variety, of good flavour, and well deserving a place. Alleway's Early Sonning is another excellent potato, let out last year, and should have a place. Looker's Oxonian and Soden's Early Oxford are fine potatoes; and while so many of these really excellent sorts are to be had, it is unwise, to say the least of it, to trust the old sorts, except on ground that has not been used for this vegetable. But of late there has been a variety in great request for late planting and using all through the winter and spring as new potatoes; we allude to Chapman's Kidney, which we have treated two different ways, with great success in both instances. We planted them the first of July, and took them up in November. They were not in any way different in appearance from new potatoes. We preserved them through the winter in mould, so that they were as much surrounded with it and packed in it as if they were growing. We put straw round the heap of mould, and again six inches thickness of mould outside, banked up like a cone. In the cones of potatoes and earth thus formed there was not more than two bushels, or at most three, and we preferred this to a pit and bank made in the usual way, because, as we only disturb one heap at a time, they are in good condition till all are used, whereas if a pit is opened the air is let in, and the whole are the worse for it after a few days. These potatoes, if opened any time from December to March, are as white and as clean as new potatoes, and, when scrubbed with a hard brush, would deceive many, and have deceived hundreds in the London markets. If they are carefully boiled they are tender and well flavoured, far more acceptable to our taste than forced potatoes. The other way that we treated them was to plant them in rows three feet apart, and in November the haulm was cut off close, the earth patted down close along the rows, and full six inches thick of soil put on them to protect

them from frost; by digging between these rows, winter greens, autumn beans and peas, and almost any other crop that was wanted, could be placed between them, chiefly, however, winter greens. These potatoes were dug as they were wanted, just as new potatoes are, and nothing could better repay us for the little extra trouble. As the rows were completed, the space they occupied was forked or dug, as the case may be, and some other crop placed thereon. Of this potato, therefore, we cannot but recommend a few; for they eat well when old ones begin to grow and are getting much worse. Although we have mentioned these sorts as well worth notice, we will not venture a word against others, nor will we pretend that older varieties are at all deteriorated by age. In selecting seed potatoes, one point should be attended to above all others. Never use any that have begun to grow if it can by any means be avoided. The use of sets from potatoes half spent has been doubtless the cause of the greater portion of failures, and it is next to throwing away the ground and the seed, for it is running the greatest risk of losing the labour as well as the crop. Much has been written and said about autumnal planting. It is opposed by many, but we have never known an instance of failure in our practice, and we do not believe it ever does fail if proper attention be paid. We have seen crop after crop destroyed by the rot, but it was chiefly because cut sets were used, and the planting too shallow. We never use cut sets, and always plant six inches deep, and not one winter in fifty would kill or even damage them under these circumstances. One of the worst evils of autumn planting is shallow planting; but even this will not often destroy whole sets; whereas even deep planting will not always save cut sets. It is not to be supposed that if we had none but fine large potatoes we should like to waste them by planting whole; but the sort to be chosen are such as, according to the proper size of the tuber, would be considered too small for market, and yet not the smallest of the rejected. A potato one-third of the size to which the finest naturally grow would be scarcely looked at in a market, but for seed it would be admirable. The round sorts of potato, of the largest varieties, would be quite large enough if of the size of a green walnut, and of the small varieties, the size of the walnut without its green husk would be quite large enough for seed. It has been often objected that autumn planted potatoes come up earlier, and are liable to be cut off by frost after they are above ground; but when potatoes are fairly up, the earth should be drawn up to them, so as to leave

only the tops out, and we have before now had a whole piece of some acres cut down to the ground by frost, but it has not prevented a fresh growth and a heavy crop. Nor do we object to spring planting, if the seed potato has not shot at the eyes. The difficulty is in procuring in spring, seed tubers that have not grown even in the pits, and been denuded of the shoots and dried. Potatoes for seed ought to be kept dry and cold, and have free access of air.

The floor of a dry cold cellar, where they may be frequently turned over, but where they are, nevertheless, free from frost; or a cold interior room, where there is plenty of air, but no warmth, frost, nor moisture, will keep the potatoes longer than they can be kept in any other way; and so far from caring about the time of planting, if this freedom from growth can be secured, we have planted Chapman's kidney in July without its having grown; and, that we might see the effect of the same treatment of other potatoes, we have been at the pains of preserving other sorts to plant at the same time, and succeeded in getting excellent crops; but they were not to be compared with the kidney, for they were, one and all, watery, and of no flavour, or a bad one. There is, therefore, something in the nature of Chapman's kidney that renders it capable of bearing this treatment when others will not. We need hardly say that they do not grow so large from July to November as they would if planted earlier, but they would not then be, as they are now—a substitute for new potatoes. Tons weight of them are sold in Covent Garden market between January and April, in pottle baskets, and at about sixpence per pound. The fruiterers and dealers know the difference, but it is not at all necessary their customers should. These potatoes, when taken up in November, may be pitted the same as others; but it must be remembered that they are not matured and ripened like those which have had a whole season to grow in, and therefore ought to be kept in the ground covered up against frost, or be packed again in the ground, so as to exclude air, which is the nearest imitation of their condition while undisturbed that we can provide them. The ash-leaved kidney is a great favourite, and some ought always to be grown. Many of those who are more clever than their neighbours, and see, or pretend to see, everything to the bottom, discovered that Chapman's kidney and the ash-leaved kidney were the same. One season after they were let out, these people were exposed, and the newspaper in which they were allowed to exhibit their profound knowledge was very properly condemned for allowing the ignorance or design of one set of men to damage the interests of

any body. Nothing but the known disposition of the paper to decry everything that was not first made known through its columns, by persons in the circle of the Horticultural Society, prevented the highly injurious statement, that the vendor of the potato was an impostor, from doing him a serious mischief. The ash-leaved kidney is very distinct from all other potatoes, and justly a favourite. Chapman's kidney would grow very much larger if planted at the same time as the ash-leaf, and the difference would be manifest. There is, as may be supposed, a good deal of difficulty in keeping the seed till July, but we have succeeded thus:—Those we want for seed are selected at the digging; all those too small for eating, and too large to throw to the pigs, those of an ugly shape, or with any kind of damage, are thrown aside for seed; when all the crop is dug to be stored, it is only one job to keep all the handsome ones for use, and throw aside the others. These are to be spread over the ground to have the sun and the wind when there is no frost, and to be covered with a very thick covering of litter or pease-haulm at night, to be kept on if there is frost. They should be turned with a wooden rake for several days, and they will all get thick-skinned and green. When they are thoroughly dried, and what is called greened, they are to be kept dry and cool—the colder and drier the better, so they be not frosted. Here they must be spread and turned in the house, as they were before on the open ground, so that they cannot sweat, nor, by being in close contact, get damp. In the spring they may be occasionally spread out, on drying windy days, on mats, in the open air, but be taken in again at night and replaced in the coldest apartment. The seed potatoes thus treated will be found in no disposition to start, and will, up to the end of June, be as sound as any seed need be. And as we are upon the subject, we wish we could impress upon all potato growers to select at the digging-up time their seed potatoes, which, to be effective without waste, should be the smallest of the middlings, and the largest of the chats; and from the moment they are selected, treat them as for seed, and not allow them to sweat and damp like those preserved for sale. Let them lie on the surface of the ground, and be turned, dried, and greened; when they are laid by for the winter, they are far less inclined to grow. As these, however, are of all the seasons, and come up in the hot months, let them green on a shady border. After the first three or four days' drying, turn them and cover them from wet. When they are laid by, let it be on a wood floor, in an inner room, cool, and protected from the chance of frost. Such extra pains will repay itself tenfold, for they are, after

this care, less liable to everything that can injure a crop. Those who take any pains with this excellent and valuable esculent should banish from their minds all the mischievous advice they have read, urging the abandonment of the potato as a crop. Such pernicious writings, from what was by accident made a sort of authority, did unfortunately prevail among ignorant men, and less planting was the consequence. The potato, as we said from the very first, has always been subject to disease, though not so virulent as the recent visitations proved; but it would have been quite as sensible to recommend the planting of no more wheat the years it was affected with the smut. We would urge gentlemen in particular to devote a portion of their gardens to the cultivation of sorts they have not yet grown; and those we have mentioned are recommended in "Glenny's Garden Almanack," (a work for the last few years looked up to as the best authority for new and good things in the fruit, kitchen, and flower garden) under the head of "Some of the best Vegetables," in the following words:—

"The best flavoured and most productive potatoes.—Thurston's Conqueror, a splendid kidney, going out this season; Soden's Early Oxford (round); Looker's Oxonian; Rilott's Flour-ball; Alloway's Early Sonning; Chapman's Kidney (for July planting); Burgess's Prolific."

This was our text for the foregoing remarks, and we cannot too strongly recommend our readers to grow some of each. The principal agents and seed-shops can supply them; or any one of the parties whose potatoes are recommended, could, we presume, supply the whole. Rilott, for instance, of Donnington, Lincoln, whose Flour-ball has been out some time, must grow pretty well all the potatoes

of any consequence that are out. The editor of the Almanac is most likely in communication with most, if not all the growers. For aught we know to the contrary, they may all be advertised in the Almanac; but this is not our business; everybody should apply to his own nurseryman for what he wants, before he troubles himself about anybody else. It is quite a mistaken notion to suppose that the people who make the most noise about a thing can serve it best; if a thing is worth having, it is soon in the hands of all the trade, and easily procured. Our business now is only to urge on those who grow no potatoes, to grow a few, and let them be the best sorts; and those who have always grown them, to grow a few of the kinds we have mentioned, and any new varieties they may be able to get worth the trouble. They will always find some sorts do better than others in their ground, and it is only by trying that they can ascertain; for notwithstanding the apparent similarity between good potatoes when well cooked, there is a very great distinction in the flavour. Many sorts are destitute of flavour, we admit. They may be dry, sound, floury, and, at the same time, tasteless; whereas others have a very distinct and agreeable flavour in addition to all the excellences of appearance and texture. But suppose any one of these first-rate kinds prove watery, ill-flavoured, waxy, or otherwise faulty, attribute it to the ground. Sell the crop (for seed), which will be in every respect as good as the finest quality, so long as they are true, to plant any where else; at the same time too, others may be—nay, will be—found altogether as excellent. It is only by growing the different kinds that we can discover this, and, therefore, every really improved sort should be tried.

GARDENING FOR COTTAGERS.

In pursuance of the plan which we have laid down for the government of those who propose to encourage the allotment system, we shall confine the directions for the small holders to those subjects which may be called useful. We mean those vegetables that are wanted in a family; for we hold that it is unwise to tempt the industrious classes to cultivate subjects that are either useless or extravagant. To a working man time is an object. If the few hours he can spare are devoted to a vegetable garden of a quarter of an acre, he may succeed in keeping it in good order; but if he were encouraged to grow flowers, he would lose more time over a rod than forty rods of vegetables would require, and unless he set up florist, and sold what he raised, his family would be the worse, instead

of the better, for his garden. Besides, allotments ought to be given for use and providing for home consumption; trading ought to be discouraged. The benevolently-disposed individuals of a neighbourhood ought by no means to allow allotments to be given to those who cannot consume the produce, until all are provided for who could make use of it. If there are more allotments than are required by proper objects, the others may be let to persons for amusement or for gain; but there should be different terms proposed, and the holders should be under agreement to give up, at very short notice, in favour of eligible applicants. This, however, does not so much affect the present work as the managers themselves, and we may leave it alone, with this one remark, that we contemplate the holders

to be under restriction to grow nothing that is not useful in a family, and within the reasonable wants of the industrious classes; and in the order of their usefulness do we propose to introduce the productions of garden allotments. After giving something like a general instruction as to the management of particular subjects, we shall add a sort of calendar, or remembrancer, of the monthly duties, and in another paper we will give lists of the best and most profitable sorts of seeds and plants with which to stock the garden. After giving our notions of the manner in which the allotment should be handed over to the holder, the work will proceed for itself, as we propose, in the order of importance in which we hold the various productions.

THE ALLOTMENTS.

These should contain twenty rods, at the least; forty would be better. Water should be within reach; a road, properly made, should pass every plot. An overseer should be appointed to keep those roads in repair, and see that no abuses exist. Paths of three feet should separate the allotments from each other, eighteen inches of which to belong to each, sufficient marks being made in the centre of the path by stakes driven down to the surface, and no hedges, or other partition, allowed. Each allotment may have two good apple-trees and one pear-tree, (Ribstone Pippin, French Crab, and Swan's Egg, or Chaumontelle;) the former, because they keep well, and are useful and wholesome, even baked without sugar; the latter, because they come in as a seasonable treat when fruit is scarce. These should be provided; and if they be not there, the overseer should be allowed to procure them for such as want them, and receive the amount in weekly payments. But we are of opinion that, as men cannot be permitted to remove trees, all that are necessary may be limited to two or three gooseberry and currant-trees, say half-a-dozen; three gooseberry, one red, one white, and one black currant. We are not going into details as to the extent to which these indulgences should be allowed, but too much of it cannot be good for the class we contemplate as allotment-holders. An allotment, then, being delivered over to a poor family on this condition, and such restrictions imposed as shall demand an industrious cultivation of the ground, provision also being made for the supply of tools, seeds, and other necessaries, at cost price, and payment for the same at a trifle per week, the bees may be fairly turned into their hive, to enjoy the sweets of profitable occupation, that will yield them necessaries in abundance, luxuries in moderation, and among other benefits, afford them healthful and rational occupation.

THE POTATO AND ITS CULTURE.

This beyond description useful and valuable vegetable has occupied more than usual attention of late years, and the visitation of disease to which it has been subject has led to its neglect as a leading crop. Whether from a wicked design to enhance the price of other food, or from great ignorance of the nature of the potato and its maladies, matters not, but persons in authority and of supposed talent have seriously recommended the abandonment of its cultivation, and too many who have faith in great names have followed the pernicious advice. With regard to the diseases of potatoes, they were as well known half a century ago as at this moment. In a paper read by Mr. Owen at the Gardeners' and Stewards' Mutual Instruction Society, there was an allusion made to the disease in potatoes, and Mr. Owen, having read this paper long before the Commissioners made a fuss about the disease, was not influenced by the late visitation, nor by the long, useless, and mysterious reports of the professors, who fancied they had made a discovery, while the old farmers and cultivators knew too well that it was an old acquaintance. The following is from Mr. Owen's paper:—

"*The disorders* to which the potato is liable are, Dry Rot, Curl, and *Scab*. The first of these, which is most dangerous, makes its ravages among our old mellow varieties, corroding them as a canker, commencing where some bruise, scab, or wound has effected an opening on the rind or skin of the tubers, and, by admitting atmospheric air to mix with the saccharine and other juices of the potato, causes gangrene to set in, and in a few months infects the whole tuber, and it becomes a brown putrid mass.

"*The Curl* is a disease that a few harvest kinds are subject to, such as *Bangor*, *Red Nose Kidney*, and most of the kidney varieties. It is caused by allowing them to become too ripe before dug out; if taken up whilst in a growing state, before the stalks wither, and exposed to the influence of the sun until they turn green in the colour, the propensity to curl will be remedied.

"*The Scab* infects all potatoes grown on lands void of fertility, that are worn out or too long under the operation of the plough, and I would not advise a potato crop in such soils. The farmer should endeavour to have his potatoes for seed from moor or mountain soils, and if such cannot be procured, from mellow fresh ones; always avoiding seed from worn out land.

"Never plant seed that are pinked, or infected with *dry rot*; in all such cases a whole or partial failure will be the result: neither should potatoes be cut into sections; it is a

mistaken economy, and should not be practised. Cuts, or *scillans*, are liable to fail during long drought; *whole tubers are not at all subject to such failure*. The seed should be chosen at the time of ploughing out, selecting the large for table or market, the small or refuse for pigs and poultry, retaining only for the purpose of seed those a little under the medium size."

The above, as the writing of a practical man in Ireland, where the disease was by far the worst, is valuable, inasmuch as it confirms, if any confirmation were necessary, the propriety of a practice that we have adopted successfully for very many years, the planting of whole sets. Without inquiring into first causes of the diseases of potatoes, we may fairly state second causes, and among these may be mentioned—

Constantly planting them in the same ground.

Constantly planting the same seed.

Storing them before they are dry enough.

Planting them after they have begun to grow.

Planting cut sets out of condition.

We are content to know that these causes, which we can understand, are too frequently the foundation of bad results; therefore avoid them. The potato may be planted with advantage in autumn; but so long as the eyes have not begun to vegetate, it matters not when they are planted; and if the eyes have begun to vegetate, no matter how early it is, the risk is always great. According to the height of the haulm, so ought you to choose your distance for planting; the sun ought to reach the earth between the rows, and therefore the width from row to row should be according to the kinds in use. Dwarf kinds may be eighteen inches apart; ordinary kinds two feet; tall-growing, two feet six inches. They should be all planted six inches deep, that is, fairly with six inches of soil above them, and from nine inches for small kinds, to eighteen inches for large kinds, apart in the rows. They should be whole sets. When they have advanced in growth, they should be earthed up well with the soil drawn from between the rows; keeping them clear from weeds, and picking off the flower buds when they come, are all that need be done, until the haulm turns brown, when they may be considered ripe. Take advantage of fine weather for digging them up, spread them a little on the surface to dry, or, if obliged to remove them, spread them out under cover for a few days to completely dry the surface. And we come now to an important period, on which so much depends. If they could be spread singly on a floor or shelves, free from heat, frost, and wet, it would be the perfection of keeping, even to the day of use. The longer, therefore, they can be so kept, the better they will store,

for the more will the moisture near the surface evaporate; and that moisture is often the only thing that makes a naturally good potato bad. Nine-tenths of the potatoes consumed in London are spoiled by some hours' soaking in water, thus undoing all that the best preservation in the world has been doing.

The preserving of the potato, then, consists in the best you can do towards carrying out the three necessary points,—absence of frost, absence of wet, and absence of heat. These can be secured by pitting them in a dry soil on straw, surrounded by straw, and covered with earth enough to exclude frost; but it is absolutely necessary to secure a proper degree of dryness before they are pitted; and before any trouble is taken with them they should be sorted; those which are too small for anything else should be kept out for the pigs, those which are large enough for planting, but not large enough for eating, should be taken out for that purpose, and the best only pitted. Dig a hole or trench in the highest and driest part of the ground, where it is well drained; say the hole shall be twelve inches deep, four feet wide, and as long as you please. Put dry sand, or small gravel, or peat earth, or straw, at the bottom, six inches deep, and upon this the potatoes, even over the bottom, and heaped up like a bank, to a complete ridge, the whole distance; let there be six inches depth of new dry straw along both sides, and earth six inches thick on that, forming a complete bank. In this way they will preserve through the winter. For the use of families it has, however, been found better to form single cones of about a sack, so that when opened they can all be removed into the house, instead of opening a ridge at one end and letting the air in.

THE CABBAGE TRIBE.

The common Cabbage, the Savoy, the pickling or red Cabbage, Brussels Sprouts, Scotch Kale, and Coleworts, appear to be one class, and Cauliflower and the Brocolis another. Viewing these in their general character, as vegetables for a family, we do not care to have too many dependent on one sowing; but as the difference of the season of planting out has a good deal more to do with the time of perfecting their growth than the season of sowing, more may be done with all the Cabbage tribe with one sowing at the end of July than any body who has not tried it can be aware of. After they are well up, and as soon as they are large enough to be handled, some of the largest may be pricked out, three or four inches apart, to gain strength for planting out; in about three weeks another batch of the strongest may be taken and pricked out in a similar manner, and in another fortnight the rest may be seryed so;

and from these beds into which they are pricked out they may be planted out from time to time, where they are to remain till ready for consumption. The ordinary Cabbage is useful in all its stages, from the instant it has green enough to eat, for it is all wholesome, and the younger the plant the more tender. It is common in autumn to plant out young cabbages, not more than six inches apart in the row; and as soon as they are large enough to be worth cooking or bunching for market, to draw two out of every three, so as to leave them eighteen inches apart in the row; and when ground is scarce, and plants plentiful, they will even plant the rows only a foot asunder, and pull up every other row completely, so that for cabbaging, the plants are left eighteen inches apart in the rows, and two feet between the rows. Savoys are planted out at first fifteen or eighteen inches apart in the row, and the rows two feet, and sometimes three feet apart. Red Cabbages are not usually grown in such plenty, but a row or two are generally planted out where they will be least in the way, because they stay on the ground some time. Brussels Sprouts require the same treatment, but may be sown earlier without much damage; and so also may Scotch Kale, or Ragged Jack, as it is sometimes called. The Cauliflower may be sown two or three times a-year, but those which are sown at the same time as Cabbages will require to be protected through the winter; but our Calendar will give the various seasons which best suit the crops for ordinary families. Brocoli is to be had of various kinds, and to come in at various seasons; some adapted for sprouts, others for fine heads as large as Cauliflowers; some to come in early, some late, but all useful, though it is by no means desirable to multiply the sorts in use; two or three kinds at most will be sufficient for all ordinary demands of a large family. The Pickling Cabbage is as valuable for salad as for pickle, and the great consumption is for salad; they require to be shredded very thin, put an hour in salt and water, dried with a cloth, and mixed with oil and vinegar, and to be used with or without any other salad. Upon the whole, there is scarcely any crop so useful and so hardy as the various branches of the Cabbage family, and we hold it almost the highest in estimation after the potato. It is wholesome and nutritious, pleasant to eat, and esteemed by many more than the potato as a vegetable in ordinary families.

THE CARROT, PARSNIP, AND BEET.

The former of these excellent vegetables has become of late in high reputation in the feeding of stock, but if they be well cooked

there is scarcely any that is more wholesome or more popular. The nutritive qualities have been tested in the feeding of stock, in which it has been proved of the highest importance, and there is little doubt but that it is proportionably excellent and nourishing for men. Here the principal operation required is to trench and bruise the earth to the depth of twenty inches; and it is necessary that the soil be light and rich. The most judicious sowing is in drills, about nine inches apart, and so thinly that one plant in every three inches may be secured, and no more; and even these may be thinned to half, as soon as they are large enough to eat, for the sake of giving room to the others to swell. The ground should be well dressed before digging and trenching, for the freer the growth of the Carrot, the better the flavour; the principal seasons for sowing are February for the early horn, March and April for other sowings to store. When up and strong, thin them to three inches apart, and the larger kinds must be even more distant than this; but the Carrot can be had at almost all seasons by varying the sowing, and even out of season by means of a common hot-bed. The Turnip, the Parsnip, and Beet-root may be sown at the same time, and be submitted to the same treatment, although both Parsnip and Beet-root will bear planting out. It is, however, far better to sow thinly, and hoe out to the proper distances, for the roots or tubers grow much larger, and are generally better; they must be six to eight inches apart.

THE TURNIP

Is a most useful vegetable to eat in abundance as a food, or to use in soups and broths for the flavour; if possible, it should be got in after a wet day, or during showery weather, but it will not do to wait too long; some should be sown in March or April, and these to be followed by other sowings a month apart, but not necessarily so frequent unless the crop be wanting, but June and July for full crops. They should be thinned out as soon as they are large enough for you to see well what you are about, and not be nearer than six inches to pull young, or nine inches to go the full size. Drills are the best for small gardens, it is easier to keep them clean, but they must not be sown too thickly, it is a waste of seed, and not so good for the plants. They must be kept clear of weeds; and if the crop be in good order, as the winter comes on, it is worth while to throw litter over them in very hard weather, for they are really valuable both in soups and as a dish at table.

THE ONION.

It would be difficult to say too much in favour of this excellent subject. A more

wholesome vegetable, or one that is more innocent, even when eaten to excess, does not exist. Soups and gravies would be nothing without them; and if one-half the people who suffer hoarseness, and colds in the head and chest, knew the efficacy of filling the stomach with cooked onions the last thing before going to bed, there would be much less to suffer, for they are beyond measure healing. No soil can be too rich for the Onion. Night-soil is used with the greatest success, and they will bear a double dressing, compared with other plants. The richest bed in the garden, therefore, may have a liberal dressing of strong manure;—guano, at the rate of two pounds weight to the rod; horse-dung, or cow-dung, thoroughly decomposed, three inches thick all over the ground, and dug or forked in, and mixed not more than one foot deep in the whole; or night-soil, decomposed, a good inch all over, and forked in and mixed with the top eight inches is not too strong for the crop, but the mixture must be complete. The seed should be sown for the main crop in April. Level the bed, and sow very thin all over alike; rake and roll it in with a heavy roller, or tread the bed all over. When it comes up, let the hoe be used, of such small size as will enable the operator to thin and weed at the same time; and it may afterwards require to be hoed a second time, not less to clear the crop, than to regulate them with greater nicety. In gardens, it is worth while to water in very dry weather, but if it be attempted, it must be done effectually. The crop requires nothing more until it has fully grown, but clearing off the weeds, if there be any; and some make a practice of breaking down the plant as soon as the tips of the leaves turn yellow: the propriety of this has been questioned. It has been said that it promotes an earlier ripening of the bulb, whereas it merely causes an earlier decay of the plant, which being bent down above the neck, soon dries up. However, the bulb has done all the good it will do, when the tips of the leaves decay, and whether the plant is bent down, or left on, matters but little. Onions for pickling are sown on poor ground. There are some who sow the larger kind of onion, at the same time, to bulb small, and store not larger than picklers, in the winter; these are planted out in the spring, in very rich ground, and often attain an enormous size; but, although onions sown late, on poor ground, will ripen their bulbs small, there are small sorts better for pickling than any of the large sorts grown small; and, therefore, seed should be purchased on purpose for pickling onions. When the crop of onions has fairly ripened, which will be seen by the decay of the leaves, they should be pulled and laid on

the surface to dry off a little, when they must be stored in a very dry cool place, far removed from frost, or the chance of it, and not be confined without air, nor in a large bulk. Shallots, which are a superior kind of onion, are grown from offsets, the best and largest roots or bulbs being taken for use, and the smaller ones replanted to grow.

PEAS, BEANS, ETC.

These crops are of great importance in the economy of a family garden, and especially for the advantage they afford of a green crop, or a dry seed. Too much attention can hardly be paid to the pea and the kidney bean; first, because, in a green state, they are a luxury; and if a crop comes in, which is often the case, when there is great abundance of every other green vegetable, you have only to leave them to ripen. This is not the place to expatiate on the value of peas in soup, and beans stewed, which are food for all winter; but it is very desirable to give a space of ground for both, and to take care that enough be sown to use green, and to preserve ripe. Peas and French beans require well-dressed ground, and careful sowing; more than two-thirds of the peas sown in the ordinary way are wasted. A row of peas, planted like beans, at equal distances, will yield quite as much as a row thickly sown; and the advantage of the regular planting is found in the strength of the stems, and the prolific bearing of each. Growing these crops upon a large scale may require a superabundance of seed to allow for the destruction by vermin, birds, mice, &c., but in a small allotment, or a cottage garden, where every foot is under the eye of the master or his family, a good deal of this may be saved. If peas be three inches from each other when well up, there will be enough for a good crop; but we mention these things to prevent extravagance in the use of seed. The best way to sow peas is, for the early sorts, on a warm border, and, for general crops, in a good open space. Dwarfs may be thinly sown in drills, eighteen inches apart, middling growing ones two feet, and tall ones three to four feet, but if the crops are sown heavy, there must be more room given. As soon as they are well up, the earth should be loosened about them, and drawn up to their stems, especially on the north-east side; indeed, for those up in the frosty months, the ridge may be drawn up higher than the peas, so as to afford complete protection to them against the north-east winds. The middling and tall-growing sorts must have sticks put to them, and the best time to put them is after earthing up, when the twigs of branches of wood should be stuck in on each side, and be made to meet at top. They require no other culture but weed-

ing, and, in very dry weather, watering. For the reasons we have given before, you may either gather them green, or leave them for seed; but do not half do either, because, if part are gathered green, they cumber the ground longer than half a crop of ripe peas are worth. Beans, of the broad or Windsor kind, may be sown in a patch, and be planted out, or be placed at once in the rows in which they are to bear. They may be in rows, two feet, or two feet six inches from each other, and six inches apart in the rows. When they are well up, earth them, and when in flower, pinch off the tops; this promotes the growth of the bean instead of the plant. These may be stewed when dried, but are not so good as the kidney bean. The scarlet runner is a very prolific and lasting green crop; it may be sown in a patch, and planted out, or put in the ground at once, in rows, six to nine inches apart. They will climb up tall sticks, or cover palings, or twine up common strings; and they are constant bearers till the frost cuts them off. They are allowed to grow a large size before gathering, but the beans within ought not to be allowed to swell much, or the flavour of the bean is spoiled, as well as the texture made coarse and stringy. The kidney bean is a highly useful crop—green, they are delicious; and when dry, as for seed, they make a capital haricot or stew. Many hundred quarters are used annually in France for their favourite haricot; and last season of scarcity they were used in many families as a substitute for potatoes. They may be sown and planted out, or put in at once, in rows, six inches apart in the row, and the rows two feet to two feet six from each other. A warm border is desirable, except for main crops, when an open space is better. These may be partially gathered, and the old ones left to ripen, but it is more desirable to pick close from all that are ripened, and to leave all upon those intended for seed, because one half the ground is thereby set at liberty sooner. We repeat our advice to pay great attention to these doubly useful crops.

OTHER VEGETABLES, AND HERBS.

Among the most important come the salads and soup herbs, celery being foremost, lettuces, radishes, and pot-herbs, coming in for their share. These are all briefly treated of in the Calendar of Operations; but celery is so universal a favourite, and withal is so useful and wholesome, that we may be allowed to go a little into the particulars of culture. For main crops, then, which should be the chief study of the cottager, the seed may be sown in March. If you can get a barrow full of hot dung, to put into a hole as large as a hand-glass will cover, so much the better. Dig the hole a foot deep, tread the dung into

it, cover with three inches of good soil, mark the place with a hand-glass, and sow the seed; sift a dust of soil over, just enough to cover the seed, and put on the hand-glass; when up, let it have air, but not the wind; and if the weather be cold, let there be a mat on the windy side of the glass. When these are large enough to handle,—say two inches high,—plant them in a warm border, richly manured, three inches apart; or, if you have a frame and light, dig up and dress a place for the plants, and protect them from wind, or fall of any kind; water gently when the soil gets dry, and shade them from the hot sun; give air in mild weather, and if there be a warm genial shower, let them have it, but not if it be violent. In this frame, or, in the absence of the frame, on a warm protected border, the plants will strengthen enough to plant out; now dig a trench a foot deep, another six inches deep, put three inches of rotten dung in each, and fork it into the ground, so as to mix up six inches of the bottom with the dung. Take the strongest of the celery plants, take off all side shoots and dead leaves, and plant single rows down the middle of these trenches. As the plants grow up, draw down the earth to their stems, and when you have filled up the trenches, draw down the earth from each side, to form a complete bank; all those portions of the plants that are under the bank become blanched, as it is called, and fit for food; but the green part is not wholesome, and sometimes has a bad effect on those who eat it. Every few days, you may continue planting out; you will soon observe which of the two depths of trench answers best. The object, however, of trenching is to be able to blanch a greater length of the plant without the trouble of piling up the soil. When all the best of the plants are planted out, take the remainder and plant in rows on the surface, but draw the earth up to the stems just the same. These last and weakest plants will not come to perfection, but they will be as good for soup as the best, and therefore are well worth the trouble. Spinach is one of those rapidly-growing crops which only require to be sown and pulled up for eating when large enough. The winter spinach should be sown about August; when up, the plants should be thinned to nine inches apart; and the mode of acting is, to eat the largest leaves only, and let them grow continuously. We have had the summer kind bear this treatment in mild winters, but the winter sort is safest. Radishes and lettuces only want sowing in good ground, rather thinly, raking the seeds well in; and if they are wanted early, and are sown before March or April, cover with litter at night, and in frosty weather. Mint, parsley, corn-salad, sage, fennel, and other herbs and salads, are grown

either from slips or seeds. Lettuces, when large enough, should be planted in rows about a foot apart in the row, and eighteen inches from row to row. They require no more care than a cabbage; and to get them to a white heart sooner than they naturally come, they are tied up with matting. Endive, in like manner, may be sown in the spring, and planted out in a warm border until it is well grown, when it should be blanched, either by tying it up together with a piece of matting, like lettuces, or covering with a flower-pot, with the hole stopped, or laying a flat board or tile upon them. Sage and mint may be torn asunder, and the pieces planted out the distances they are to remain; they will root as freely as plants, if done in wet weather, or they are well watered after they are in. But these may be called permanent crops; neither sage, mint, fennel, nor any other of the perennial plants, require renewing for years. But herb-beds should be made by themselves. Parsley may be sown round the edges of beds, or in rows, in an appropriate-sized portion, according to the wants of the family. There is also a useful vegetable consumed in stews, or eaten by itself, which some people think worth growing — the Jerusalem artichoke. It can hardly be treated wrong, for it is almost like a weed in the garden: the tubers grow like the potato, but they are good at any age. They may be planted like the potato, but the plant grows so tall, that it is usually put where there is a fence to hide, or a gap to stop, or the ground is naturally bad. It is an awkward crop for an open space, because of its great height, generally reaching, as it does, eight or ten feet in good ground, and six feet in very poor soil. Leeks are of great use in all families; they require the same treatment as onions, but will bear planting out; they should be in rows, nine inches apart, and when they have attained a good size, they may be earthed up to blanch, but if they are earthed too early they will be injured, and their growth materially checked. A little attention to the Calendar will inform the reader of all he need know to successfully cultivate his cottage garden.

THE CALENDAR OF OPERATIONS FOR THE ALLOTMENT HOLDER.

In introducing this Calendar of proposed operations for every month in the year, we must remind our readers that, so far as each particular month is concerned, it will be impossible for the most enthusiastic cultivator to keep pace with us in some parts of the country, for, as will appear obvious on a moment's reflection, there will be a month's difference between two situations, not only according to the extreme points of distance,

but the difference between hill and valley, and between the north and south side of a hill. The routine which we propose is calculated for a place possessing all the advantages of our climate—good soil and situation; experience alone will teach the amateur whether he shall begin before or after the time laid down: whether at the beginning, or the end, or the middle of the month. We shall endeavour to give a few general rules for meeting difficulties and improving advantages, and with these rules and common attention, a tyro will be able to make the most of his garden.

GENERAL HINTS.

Cabbages and Cabbage Plants.—Never be without cabbage plants. You will be directed several times during the year to sow seed for the purpose of keeping up a stock, that you may always have plenty to fill vacancies. There are those who say that two or three sowings in a year are enough; rather let us have five or six, or more, from choice. Those plants which have not received a check are infinitely better than those which have been stunted in the seed-bed.

If repetitions of the same directions occur in two following months, it is to be understood the operation is required two following months, or that, if it has not been done the first, it may be done the second. "Plant Potatoes," for instance, may be in the directions for March, and be repeated also in April and May: whoever reads this may please himself to have all planted at once in either of the months, or some in each month. So also "earth up Celery" may be in several months running; that is one of the operations which goes on constantly until the celery is taken off the ground. So with many other operations. If it be a thing which, once done, is done with, the person who has done it at the first direction will, of course, pass over it when he sees it still among the instructions.

All operations are directed upon the presumption that the weather be favourable; and if not, the execution of the business must be deferred till it is favourable. For instance, if the ground be hard frozen, seed cannot be sown; but if the frost delay the sowing, it must be done as soon as it is practicable. So also there may be a direction to cover against frost when there may be warm weather instead of frost; but as frost comes in an hour, and in the night, it is as well that such directions be attended to the last thing in the evening, in seasons liable to frost, be the weather, during the day, what it may.

Never continue crops on the same piece of ground twice running unless you are obliged; let lettuces follow carrots or parsnips, and

peas follow turnips or potatoes; and in general, let those which do not like raw dung follow the crops which do.

Watering Crops.—It may be very well to give hints on the management of particular subjects which require great attention, but in a general way all crops want occasional watering in hot weather: this should never be done by halves. Soak the whole ground once a-week rather than sprinkle once a-day; never water wantonly, but do it in earnest when you do it at all, and the weather and the look of the crops must be your guide.

Ground should never lie idle; that is to say, the crops should be cleared off when done with, and the ground should be dunged, if it requires it, and dug. If in autumn or winter, or early spring, it should be ridged, and in summer left rough. The ground then, although not cropped, is being prepared for it, and no weeds ought to be allowed to grow.

All paths should be clean, and the edges of beds and borders should be even. Sowing the edges with parsley is a good and useful plan, but a warm border may be edged with strawberries, a foot apart; in any case the paths, and the beds and borders, should be well defined, and paths kept high and dry in the middle.

Every man should know that weeds ought never to be seen; that plants ought not to suffer for want of water; that vermin, such as slugs, snails, aphides, earwigs, ants, the black fly, caterpillars, wire-worms, grubs, &c., ought to be destroyed. Such operations mentioned once, ought to be considered mentioned for all times. So, also, covering up against frost, wet, and cold winds, once mentioned, is as good for October as for April, and all the intervening months.

Whenever an operation directed for one month is left undone, do it as soon after as possible; it is a penalty for delay if it turn out worse than you wish; but it is often better to have a bad thing than none at all.

JANUARY.

Hedges should be cut and trimmed, and, if damaged, mended with new plants of the kind, or by laying down some of the branches of the old; in doing this the branch should be cut half through, and bent down to fill the gap. Box edgings may be made, and planting done.

Peas.—Sow early peas in rows a yard apart, the more sheltered the place the better.

Digging.—Dig up vacant spaces when crops have come off, and plant out cabbage a foot apart, in rows eighteen inches from row to row. Autumn-sown beans for planting out should be protected, and some of the more early kinds should be sown for transplanting.

Cauliflower Plants under glass, or shelter, must be protected from frost and excessive wet, by extra covering.

Lettuces and Salads under cover must be kept dry.

Winter Crops.—Hoeing between the rows, and earthing up round the stems, should be attended to in mild dry weather.

Celery.—Earth up, and in hard frosts protect with litter.

Small Salad, Radishes, &c. if wanted before their season, may be planted or sown in hot-beds, or even in the ground, covered with a glass.

Mint may be potted, and grown in a hot-bed, or in any protected place, to hasten its growth.

Cucumbers and Melons may be begun now as well as at any time; or, if begun last year, look to the linings, and see the heat does not decline. See April.

Rhubarb or Sea-kale may be forced by covering with a pot and surrounding it with hot dung; but the former will grow if potted in a warm cellar or cupboard.

FEBRUARY.

The mending of hedges, planting, &c., may go on as in last month.

Strawberries.—If you have unwisely or unavoidably delayed removing strawberries for new beds in the autumn, now is the time to do it. Also clean strawberry beds, and top-dress them with decomposed dung.

Gooseberries and Currants.—The same may be said of gooseberry and currant-bushes, raspberry canes, and fruit trees in general, but we direct these things to be done in autumn.

Rhubarb and Sea-kale may be covered for forcing, with pots or boxes, and surrounded with fermenting leaves, or hot stable-dung.

Peas.—Sow for a succession crop to those sown in November and last month; or if you have not sown any, sow for your first crop, not too thick nor too many, as we recommend sowing every month till July; earth up any that are advancing in growth.

Beans.—Sow also early beans in drills a yard apart, and the beans three inches apart in the drill.

Cabbage.—Plant out in vacant spaces the strongest from the August seed-bed, twice as thick as required, that half may be pulled for greens, such as are now bunched.

Sow **Radishes and Lettuce** in a sheltered situation, where they may be easily protected with litter, such as clean straw and peas haulm, which can be spread over them at night, and remain on them in a frost, but be taken off in the morning in mild weather.

Onions for Seed.—Plant out a few fine bulbs to go to seed; plant the bulbs two-thirds in the ground, and a foot from each other.

Potatoes.—Plant a few in the warmest border, in a row, at the foot of a fence or south wall.

Cucumbers and Melons.—Look to the linings and the state of the heat; give air occasionally in the day-time; lay the branches equally over the bed, and top the end of the shoots that may be too vigorous and show no fruit.

Mushrooms.—Beds may be made by placing a sloping heap of horse-droppings against a wall, and covering it while warm; then put lumps of spawn (which may be had of the nurseryman) nine inches apart all over it, and two inches of good light loam, well patted with the back of the spade; cover the whole with straw, to keep off wet and cold, but in a shed will do better than in the open air.

Kidney Beans may be sown three in a pot (size sixteen), to be forced in a common hot-bed, greenhouse, or stove.

Cauliflowers.—Sow under glass, and protect plants as last month.

Celery.—Earth up in dry days; a little may be sown if you have any protection.

Carrots, Parsnips, Beet, Onions, and Spinach.—Sow a few seeds of each, or any.

MARCH.

Clearing the ground among all sorts of crops and young trees is a necessary duty at this time.

Turnips.—Sow a few early in a warm, sheltered situation, after rain or watering the ground, and if there be dry weather, they must be watered freely till up.

Potatoes.—Plant a few potatoes, whole sets of moderate size and early kinds. If you have any well-rotted dung, dig trenches eight inches deep, two feet apart; put dung three or four inches thick in the trenches, and the potatoes upon them; draw down earth upon them to cover them well six inches. These are for an early crop. As they come up, throw litter over them, to protect them in frost or cold winds, or plant them six inches deep with a dibble.

Beans.—Plant out from the seed-bed in rows two feet apart, and the plants about four inches apart in the rows.

Radishes.—Continue to sow a few, if they are required, to succeed those sown last month.

Horse-Radish.—Cut horse-radish into pieces an inch long; trench the ground fifteen inches deep; place these cuttings in the trenches as you make them, six inches apart, and cover up with the soil which you take out of the next trench. It is a vulgar notion that you are obliged to plant crowns; any inch all the way down a stick is as good as the

crown, and it is better to trench them into the ground than to make holes for them.

Carrots.—Sow some early ones in a sheltered situation, first breaking the ground well to a spit and a half deep; rub the woolly seeds apart in some sand, and sow in drills nine inches from each other, covering them very lightly.

Cauliflowers.—Sow some seed in a warm situation and in rich ground.

Cabbage.—Sow some of the early sorts in a warm border or quarter.

Celery.—Sow some seed in pots or boxes, to put into a cucumber frame, and grow it for early planting, or to enable you in some measure to shelter it if necessary.

Leeks.—Sow in a warm situation; a moderate patch will be sufficient for a tolerable crop when planted out.

Mint.—The roots may be dug up and parted, and fresh plantations made; some potted and put into a frame, or even into a warm room, will be found useful perhaps, especially as it is in such great request early in April for mint sauce.

Onions.—Sow for a first crop. The ground should have been lying in ridges through the winter; strong, well-decomposed manure should be plentifully dug in and mixed with the soil, which should be levelled, and the seeds sown thinly and evenly all over the bed, unless the appearance of drills be preferred. The seed must be well, but not deeply covered, and well trodden or rolled in.

Peas.—Sow more peas for a succession; the earlier sown ones already up must be cleared, and earth drawn to their stems in a ridge on the shady side of the row, and pretty high up, to protect them from the cold winds; also stick those that require it as soon as possible, as it protects them from wind and frost.

Borage, said to be excellent for bees, may be sown wherever they are kept, and be allowed to take its chance without any other culture than clearing it from weeds.

Savoy.—Sow in open ground.

Lettuce of all kinds, and salads generally, sow for succession. Plant out Lettuces in warm situations.

Asparagus Beds.—Spread some very rotten dung over them, two inches thick, and fork it in carefully.

Spinach.—Sow every three weeks if you use much, and sow in proper quantities.

Jerusalem Artichokes.—Plant a few like potatoes in any out-of-the-way place, or for a blind. They are a tall crop.

APRIL.

Vermin.—Examine all fruit trees and bushes, and clear them of vermin.

Sea-kale.—Sow the seeds in a small bed, and cover an inch; refresh with water when it gets too dry; cover with a pot, and surround with hot stable dung any established plants that you wish to force.

Rhubarb.—If you raise this from seed, now is the time to sow it in rich good soil.

Radishes.—Continue to sow, if you require them for use.

Potatoes.—Plant more potatoes for a fuller crop than the last; middling potatoes whole, are far better for the cottager than cut sets of larger ones. It is a fallacy to conclude that the largest potatoes have the largest eyes; there is no fallacy in preferring a whole potato to a cut set; if they do not go quite so far as cut sets, you have only to plant them wider apart, and get a heavier crop of each. We have seen a better crop of potatoes in a cottage garden, from chits thrown by for pigs, than from many of the most highly cultivated grounds when cut sets were used. Plant as directed last month. If you are obliged to use large potatoes, cut each piece with one or two good eyes to it. Cut sets may be planted nine inches apart; whole potatoes, though smaller, should have a foot distance between them.

Savoy, Brocoli, Scotch Kale, and Brussels Sprouts, should be sown this month, about the middle, if the weather suit; make up a bed, and sow a good patch of each, according to your wants; let the bed be well dug and dressed for them.

Herbs of all descriptions should be slipped or parted, and planted to make fresh beds where necessary.

Peas should still be sown once a-month, or even twice, according to the consumption.

Onions.—Sow the main crop. Let the ground be well dunged and dug, and sow as before; plant out a few large ones for seed, either large Portugal, Spanish, or Tripoli.

Lettuce.—Sow more lettuce; indeed these, as well as peas, should be sown in smaller quantities, and continued every month, so long as the supply is required.

Beans also, if required, should be sown again, as soon as the last sowing has got the second pair of leaves open. Sow them in rows to bloom where they come up; let the rows be two feet apart; earth up those which are growing fast.

Turnips.—Sow a few, and then thin out as soon as they have two rough leaves, leaving them six inches apart.

Celery.—Sow a piece the size of a large handglass, or of two glasses, for the main crop, and use the glass to protect them.

Carrots.—Sow a few more, as last month.

Small Salad and Corn Salad may be sown as required.

Cucumbers.—Make up a heap of three or four barrows of hot dung, cover it with three inches of mould, put on a hand-glass, and sow your seeds in pots, two in a pot; cover close, that the steam of the dung may not get inside the glass—there will be heat enough here to grow the seeds: meanwhile, make a regular hot-bed; drive four stakes down into the ground, to form a square one foot larger every way than the garden frame is wide; take out hot stable dung, and pile it up so as to build up this square three feet high behind, or north-east, and two feet six inches in front, or south-west, patting it close with the dung fork through the whole progress of the work, the top being left an even slope; then put on the garden frame on the centre, and the light upon it, the low part of the frame upon the lowest part of the dung; poke a stick into the dung as far as you can, and leave it there; by pulling this out now and then, and returning it, you can always feel the real heat of the centre. When the rank steam is gone, your seeds will be well up under the hand-glass in the other dung, and the pots may be removed into the bed; but about two inches of mould should be put all over the dung inside the frame, to keep the steam down and the bed sweet; the pot or pots of seedlings may stand in the frame till they get four rough leaves, when the ends must be pinched off, to make them throw out lateral shoots. Now put a barrow-full of good loam and dung mixed in the centre of the bed in a heap like a cone, and if there be more than one light, a heap under each; make a hole in the centre of this heap, like a basin, and plant the ball of earth which contains the plants in it, so that the surface of the ball shall be about six inches from the level soil, and refresh them with water. As the plants grow, the roots will protrude through the sides of the cone or heap, and fresh mould must be added round it to cover the roots, and so continue for the present.

Tomatoes and Capsicums should be sown at the same time as the cucumbers, at the beginning of the month, and on the same hot-bed.

Kidney Beans.—Sow in rows two feet apart, and the seeds four inches from each other.

Spinach, sown before: hoe that already up, leaving it four inches apart.

Beet Root, if not sown before, should be sown now.

Garlic and Shallots.—Plant in drills, a foot apart, and six to nine inches from root to root.

Parsley and other herbs: sow the seed, Part or slip herbs to make new beds.

Cabbages.—Plant out any that are strong

enough. Thin those on the seed beds. Prick out from them all that are taken out to thin them.

Cauliflowers.—Plant out, in good ground, the plants kept over the winter.

Parsnips.—Sow in a patch for planting out.

Vegetable Marrow.—Sow in heat—a few plants will suffice.

Hoeing and thinning crops, weeding, planting out greens that are large enough, &c., go on as usual.

MAY.

Strawberries in Flower will require watering, if the weather be at all dry.

Broad Beans.—Sow more of any kind, if it be desirable to have successive crops, though few care to have a continuance. Take the tops of those in flower, and draw the earth round those recently up.

Savoy Seed.—Sow for a late crop; plant out some of the earliest sowing.

Peas.—Sow some twice in the month; peas should be sown right through the season, every fortnight or three weeks, and not in large quantities; earth up those which are up and advancing; stick those which are forward enough.

Endive should be sown for a few early plants in rich open ground.

Pot Herbs may be sown, and slips may be still put into the ground.

Radish Seed.—Sow more, and choose some of the handsomest of the crop gone by, to plant for seed; choose those which are most smooth-skinned and bright-coloured; plant them in a row, two feet apart.

Celery.—The March sown will be large enough to prick out; take the largest, and contrive to thin the seed bed all over, rather than clear it in any part; prick them out three to four inches apart, on a piece of rich ground, there to strengthen six weeks, where you can cover them if required; water them in to settle their roots.

Onions must be hoed and cleared; the plants for bulbing must not be closer than four or five inches; if, however, any be left, they may be drawn for salads; but it is better not to have the bed trampled upon oftener than is necessary, therefore it should be cleared of all weeds, and properly thinned at once: support the stems of those going to seed.

Cabbages.—Transplant a quantity of the spring sown ones, in rows, eighteen inches apart every way. Tie up some of those that are forward enough, so that the hearts may be whitened; earth up those that are advancing, loosening the soil, drawing it up the stems. Sow other seed, for you should never be short of plants,

Cauliflowers, protected with hand-glasses, are now beginning to show flower; and when this is the case, break down one or two leaves to cover them from the wet and sun. If the weather prove very dry, the plants must be watered; transplant others from the seed or nursery bed, and sow more seed.

Brocoli Seed must be sown this month; and it is better to sow two or three kinds, and at two separate seasons, a fortnight apart.

Kale or Brown Cole, or Borecole. Sow this month, if it be intended to grow any, for it is a coarse vegetable at the best, though hardy, and good eating in a hard winter.

Beet Root.—Sow some in the same way as you would carrots, but more thinly spread.

Kidney Beans may be planted for a principal crop, and scarlet runners. The former in drills, three inches to four apart in the drills, and the drills eighteen inches; the latter six inches apart in the drills, and the drills three feet apart.

Capsicum and Tomato Plants.—Put a few under a south wall, or at the foot of a south bank, at the end of the month, having pricked them out two in a pot at the beginning, and grown them in a cucumber bed; turn the bulb out whole, and water to settle the ground round them.

Lettuce.—Transplant some of the strongest lettuce plants, thinning the place they were sown in, that the rest may perfect their growth on the seed bed. Sow some of the different varieties.

Cucumbers.—Level the soil in the bed, and lay the branches out of each other's way; pinch off the ends of vigorous shoots.

Small Salad.—Sow mustard, rape, cress, radish, and other small salad herbs.

Spinach.—The sowing of this must depend entirely on the supply required; if it be required in any quantity, it must be sown once a fortnight, as it should be pulled and eaten before it runs up to seed. It may be either sown evenly all over a piece of ground allotted to it, or in drills a foot apart from drill to drill, and be thinned out to a foot apart, as soon as they have any green about them to eat: for this, six leaves are wanted, and those which are left may be plucked of their leaves twice a-week.

Turnips.—Sow turnips, and hoe and thin out to six and eight inches apart those which are forward enough.

Carrots and Parsnips must be also thinned out as soon as they are large enough, and must not be left nearer than eight inches apart; and carrot seed may still be sown.

Scarlet Runners.—Sow the first week, six inches apart, in rows three feet from each other; but generally they are sown against palings, or anywhere, for a blind.

Asparagus.—Let this, for your own eating, grow three inches above the ground before you cut it.

Melons require constant attendance, both to the heat and the fruit; not more than two or three melons ought to be grown on each plant at one time, and not even those for show.

JUNE.

Strawberries.—Pin down or put stones on the joints of such runners as you want for planting new beds; they strike more readily.

Turnips.—Sow for a principal crop, roll them in, and if there has been no rain for a considerable time, water the ground the day before and the day after.

Scarlet Beans.—Sow if not done already, and earth those already up and advancing.

Salads, Radish, Lettuce, &c., may be sown again.

Peas.—Sow the early kinds, as they grow faster than late ones, and are sooner in flower.

Beans will bear another crop, to be sown for those who like them, but this is a matter of taste.

Transplant after a shower, or after well saturating the ground with watering, borecole, Brussels sprouts, leeks, sprouting brocoli, and cabbage, in rows eighteen inches apart, and fifteen inches apart in the row; but the cabbage may be planted half the distance apart, and every other one pulled out while small, for greens.

Celery.—Plant out a few of the strongest plants for early use, in rich manured ground well dug, and in a trench not more than six inches deep.

Sprouting Brocoli, Cabbage, and Kidney Beans, may be sown.

Onions.—Hoe and weed to thin and clean them.

Cucumbers.—Give air, stop leading shoots, and regulate them so as to spread equally over the beds.

Potatoes.—Plant out the latest crop, except Chapman's, which is planted in July.

Carrots, &c.—Sow carrots and onions to pull young, and spinach, &c., to succeed.

Turnips.—Thin turnips, spinach, carrots, and other crops requiring room; hoe and weed; earth up the various peas, beans, &c.; stick beans, peas, &c., and generally look to routine business.

JULY.

Strawberry-beds.—Make beds of the strongest runners; but to anticipate this, the runners may be pegged down in June, in pots placed on the old beds, and they will have struck root sufficiently to turn out in the new beds, or to force in the pots.

Fruit bushes and trees should have their useless spindling growth cut out, currant and gooseberry trees especially, whose fruit ought to be thinned, so as to give the remainder the whole nourishment of the tree. For exhibition they ought to be four inches apart on the strongest branches, before they are larger than peas.

Scarlet Beans.—Put sticks to them, or give them some other means of support.

Potatoes.—Earth up well to cover the tubers, and give them room to swell. Plant Chapman's new kidneys to supply new potatoes all the winter and spring, from taking up time in October and November till May.

Lettuce, Radish (the turnip kind), and *Salads*.—Continue to sow enough to meet the consumption.

Cucumbers.—Train the shoots along the surface, so as to be out of each other's way; give the fruit room, and water must be administered; give proper air; plant out some on ridges under hand-glasses.

Celery.—Plant a main crop of; use the strongest plants, dig trenches a foot to a foot and a half wide and a foot deep, four feet apart from centre to centre; put a good three inches thick of rotten dung in the bottom, and fork it six inches deep into the soil, well mixing it as you proceed; level, and plant nine inches apart down the centre of the trench; these to be earthed up as the plants advance.

Winter Greens, Brocoli, Savoy, Borecole, Brussels Sprouts, Red Cabbage, Scotch Kale, &c., should be planted after dripping weather; a rainy season saves enormous labour.

Winter Spinach.—Sow according to your wants.

Beans.—Top those in flower, and earth up others.

Peas.—Sow as long as you wish to chance a crop.

Turnips may be sown after showery weather. Hoe those up.

Leeks.—Transplant nine inches apart.

AUGUST.

Strawberries.—Cut off the runners from old plants, clean the beds, plant the runners if wanted in nursery beds, pots, or new fruiting beds.

Destroy Wasps, Flies, Ants, &c., near choice fruits.

Spinach.—Sow the main crop of the winter sort.

Parsley should be rogued, as it is called, that is, every root, that has not a well-curved foliage, taken out; the rest may be cut down pretty close.

Onions that have nearly come to their growth should be bent down, to throw the

greater share of nourishment into the bulb ; so say the market gardeners. It may hasten ripening.

Salading.—Sow as before, if the supply be required, and particularly lettuces, to stand through the winter.

Leeks should be earthed up three or four inches, to whiten them.

Cucumbers should have all the weak and useless shoots pulled off, dead leaves removed, and be shut down in cold winds, and always towards evening. Those out of doors require the same, all but shutting down. The hand-glass should be kept down in heavy rains.

Celery requires earthing up as it grows ; the soil should be broken small and drawn to the stems, but not to fall in the heart of the plant, which should be closed while earthed.

Cabbage Seed should be sown for a good crop to come in the spring and summer ; sow after a good wet day.

Brocoli.—Plant out the last of any or all kinds from the seed-bed, and choose wet weather for the job.

Hoe between all kinds of crops, clear away the weeds, and stir the ground.

Beans.—Top those in bloom, and earth all up.

In many other respects operations should assimilate to the business of last month.

Gather in seed of all kinds as they ripen, and keep from damp ; they may lie in the sun to ripen.

Cauliflowers, to be protected through the winter, may be sown the third week.

Winter Greens.—Plant out every description wherever you have room.

Lettuces.—Plant out all the kinds in open spaces.

Turnips.—Sow after rain, for no good season ought to be lost.

SEPTEMBER.

Fruit must be gathered in dry weather, and if possible, when the sun is powerful ; in makes a remarkable difference in the period of their keeping.

Potatoes that are ripe may be taken up and stored ; they are always ripe when the haulm is decayed. They may be stored in a dry cellar covered over with straw, or in pits covered over with straw and mould.

Onions, as they ripen, must be drawn and dried in the sun on the ground for a day or two ; they should be stored very dry and cool.

Celery.—Earth up as usual, choosing dry days for this work.

Cauliflowers.—Prick out the August-sown ones ; the warmest and best place in the garden should be chosen, if they are only to be protected in the ground ; but if you have

a common garden frame and light to spare, dig up a space the size it will cover, and plant them three or four inches apart all over it.

Coleworts.—Plant out in any spare ground cabbage plants, six inches apart, and in rows fifteen inches apart, to be drawn as coleworts, or, as market people call them, collards.

Spinach.—Hoe winter spinach, removing them where too thick, and leaving them six or eight inches apart ; the more room they have the faster they grow, and the better they taste.

Horse-Radish.—Form new beds as directed for March ; this is the better month of the two, though when it has been allowed to stand over, March is the last chance of success.

Seeds should be gathered as they ripen ; they will otherwise be in danger from birds, or the pods splitting and dropping them about.

Salads.—As usual every month ; if there be a demand for another supply, they should be treated nearly alike.

OCTOBER.

Fruit Trees and Bushes, Raspberry Canes, &c. may be moved in general from the end of the present month to the period that they begin to swell their buds ; so, also, may the pruning be commenced. In pruning gooseberries and currants, the side branches should be cut pretty close to form spurs, and the main branches should not be sufficiently numerous to be in each other's way. These bushes do best in strong rich land, and it should be trenched eighteen inches deep before they are planted.

Cabbages.—The August-sown should be planted out for spring use twice as thickly as they are wanted, that when every other one, or two out of every three, are drawn for greens during the winter, the others may be left to form cabbages. The weakest may be left in the seed bed, to be pricked out three inches apart for future planting.

Lettuces.—Plant out in warm situations.

Carrots and Parsnips full grown, may be taken up for storing.

Celery.—Earth as usual.

NOVEMBER.

Now, be it remembered, removals of plants and alterations of beds, clumps, and improvements of all kinds should be carried into effect. Making gravel walks and planting box or other edgings are certain duties at this period. Cleanliness at all periods is a paramount consideration. The leaves which fall should be swept up and preserved as valuable manure. All the waste of the garden should be thrown together and allowed to rot for the same purpose ; and whatever you have

of the kind already decayed should be esteemed as the finest dressing you can apply.

Hoeing between crops, weeding, clearing paths, digging vacant spaces, and leaving them in ridges or rough dug, are self-evident duties ; so also is the destruction of all kinds of vermin.

Cuttings of currants and gooseberries may be planted, if you want young ones.

Some of the earlier Crops, (those which we may fairly call speculative, because it is a chance how they stand,) may now be got in ; a few early beans and peas may be tried, because they are useful if they stand, and no great loss if they miss.

Dressing and trenching, or digging all vacant spaces to be left rough, or in ridges to be mellowed by frost, prepares it for spring sowings. Hoeing between crops, and clearing them from their lower leaves that are decaying, must be attended to.

DECEMBER.

In bad weather, in-door work should be attended to, and should be done when nothing can be done out of doors. Continue as directed last month.

In dry mild weather, alterations, planting, and various pruning work should be done, and the cuttings gathered up and stacked for fuel, or burned to put the ashes on the ground. It is also in the winter season that manures and soils should be collected, and the heaps turned over to mix well by the time they are wanted. No weeds should be allowed to grow among the compost. The principal soils, &c., to collect, are road-scrappings, loam, cow-dung, horse-droppings, sand, turves, leaves of trees, pig and poultry dung, &c.

If the weather be mild, the vegetable garden should have the management of last and previous months continued.

The foregoing memoranda of operations to be performed in the several months will, after the general remarks on each vegetable, be sufficient for any amateur, however little he may be acquainted with gardening. But the whole is written with a view of carrying out the recommendation preceding the work ; we have confined the subject to those calculated to be useful and profitable to those in humble life. We have said but little of draining, because the holder of an allotment ought not to be obliged to drain, nor could he one time in a hundred accomplish the task by himself. The same may be said of most cottage-gardens ; a man might do all that could be done, but without a water-way to carry off the drainage his work would be useless ; draining is, therefore, a labour that ought not to be re-

quired of the allotment holder, nor of the cottager. The entire land should be drained by those who grant the allotments or own the ground. It also presumes that poor men are not set to work on hungry unprofitable land ; such allotments would entail upon the holders a loss instead of gain. We have seen a little of this in our time ; and in dry seasons the poor men, with all they could do and get done, never took off as much crop as paid them for the material they put on. Did we contemplate such an evil, we should endeavour to find a remedy—or rather a palliative, for there is no remedy ; hungry land will have good dressing, or yield no crop ; and it is a mockery of misfortune to let such ground to the poor—an affectation of benevolence even to give it them for cropping. It may be objected that we have said nothing about flowers, but after objecting altogether to the encouragement of this branch of gardening in allotment-holders and cottagers, such directions would be inconsistent and out of place. It is enough that we teach the useful, and leave them to find out the ornamental. We do not go so far as to object to their growing flowers, but we abstain altogether from holding out the temptation. The fruits also are limited to those of easy culture, and of some service. Apples, pears, gooseberries and currants are of good produce and great service, and strawberries take but little room if made edgings for the beds on the south side of the garden, and therefore are admissible. This work is especially directed to the carrying out of the main object of allotments, and consequently comprises no subject that is not in all respects adapted for the use and comfort of the family whose wants may be fairly compassed by the means we have pointed out. It is all very well for those who say “teach everything,” and let men choose for themselves, but it is impossible to prescribe a limit to gardening. All that the true philanthropist should do is to tempt a man to do all that will be profitable and useful to himself and family ; and so far from encouraging anything further, he ought to afford no facilities, but rather to oppose it. Whenever the cultivation of flowers is undertaken for amusement, and within proper restrictions, it is by no means a costly or a difficult pursuit. Those who can grow a cauliflower can grow any other flower ; but where it is desirable to let this be the last thing to be thought of, it would be unwise to take any notice of it in those monthly directions which are much better confined to the things that are wanted.

As Bee-keeping, Poultry-keeping, and Pig-keeping seem to be almost consequent on the supply that the garden affords, we add a few words on these subjects.

BEE KEEPING.

This is one of the legitimate uses of a garden to the working classes. Honey is a good substitute for butter in the food of young children—it is a substitute for sugar with adults. A hive or two should always be kept, if it can be done without inconvenience. The following compilation, taken chiefly from the excellent little book called the *Apiarian's Guide*, is sufficient to teach a beginner.

SITUATION OF AN APIARY.—A south aspect is decidedly preferable to any other situation for an apiary. I have tried various aspects, but the bees in the south I have always found to be the healthiest, and to collect the largest quantity of honey. It is very important that the hives be sheltered from the wind by trees or houses, and that they are not placed in the vicinity of ponds or large rivers, for high winds will dash them into the water, where numbers will perish.

Though large ponds are very injurious, a small stream is beneficial to them, which if they are not supplied with, water must be given them, for it is absolutely necessary, and enters, as much as honey and farina, into the composition with which they nourish the brood. The plan that I have for many years adopted, is to fill an unglazed earthen pan, eighteen inches by eight, four inches deep, and square at the sides, with water, upon the surface of which floats a very thin deal board perforated with holes; in spring and summer the bees may be seen coming in great numbers to drink, or rather to carry water into their hives to mix with the farina they collect so abundantly at this season of the year for food for their young. In my opinion, Dr. Bevan says very justly, that "the apiary should be near the residence of the proprietor, as well for the purpose of rendering the bees tractable, and well acquainted with the family, as for affording a good view of their general proceedings."

Bee-houses of all kinds are the means of causing the ruin of a great number of hives, by affording a home to their worst enemies, viz., mice, moths, spiders, earwigs, and various other insects; thousands die from imprisonment, and many hives are destroyed by humidity. The method of placing several hives upon the same bench is also very injurious; it very much facilitates pilfering, and renders it impossible to operate upon one hive without disturbing the others.

The hives should be placed upon separate boards, supported by single pedestals four or five inches in diameter, firmly placed in the ground, and standing about fifteen inches from the surface; upon the top of this post should be nailed firmly a board nine inches square,

upon which should be placed the board the hive stands upon, but not nailed; the double boards will be found very convenient for weighing or removing the hives, without disturbing the bees.

On no account use clay or mortar, as is usually done, to secure the hive to the board; the bees of themselves will do it more effectually; clay or mortar tends very much to decay the hives, and to harbour moths and other insects. Each hive should be covered with a large milk pan, and be well painted every year, for hives managed upon the depriving system are expected to stand from fifteen to twenty years.

The hives should be placed about three feet apart from each other, and in a right line; but should the number be too great to allow of this arrangement, and render two rows necessary, they must not be less than fifteen feet asunder, and those in the front row intersecting the line formed by the hinder one.

The boards on which the hives are placed should be cleaned about four times in the year—January, March, April, and November—much time and trouble will be saved the bees thereby.

Plants which rise in height equal to or exceeding the entrance of the hives, should not be suffered to grow in their immediate vicinity, and every facility should be removed by which the enemies of the bees can ascend into the hives.

Still, however, a few shrubs or standard roses of four or five feet may with advantage be placed eight or ten paces in front of the hives, for the bees to alight upon in their return home when heavily laden with honey and pollen—it saves their falling to the ground from the weight of their load, which they frequently do, and in unfavourable weather to rise no more.

The author of the *Guide* has found the advantage of planting, in the vicinity of the hives, a large quantity of the common kind of crocus, single blue hepatica, *Helleborus niger*, and *Fussilago petasites*, all of which flower very early and are rich in honey and farina. *Salvia nemorosa* (of Dr. Smith), which flowers very early in June, and lasts all the summer, is in an extraordinary manner sought after by the bees, and when room is not an object, twenty or thirty square yards of it may be grown with advantage: *Origanum humile*, *Origanum rubescens* (of Haworth), and *mignonne* may also be grown; cultivation beyond this, exclusively for bees, I believe answers very little purpose.

Dr. Bevan says:—"Those residing in towns may consider it indispensable to the success of an apiary, that it should be in the immediate vicinity of good pasturage, and be

deterred from benefiting and amusing themselves by keeping bees because they have no such convenience, are informed that the apiary of the celebrated Bonner was situated in a garret, in the centre of Glasgow, where it flourished for several years, and furnished him with the means of making many interesting and valuable observations which he gave to the world about thirty years ago."

The author of the little work we are noticing kept two stocks of bees in his study, in glass, and four or five others in the improved cottage hive upon the roof of his house, and was not aware that they have ever done better, or afforded a larger quantity of honey in any other situation.

The following are wholesome and useful hints:—

The best time to establish an apiary, is from the middle of February to the middle of March.

The young apiarian should, in buying his stock, take the opinion of an experienced person, weight being no criterion of value, because old hives are frequently loaded with pollen or farina, which has been accumulating perhaps for years.

Never buy old hives if you can buy swarms of the preceding year.

When young swarms are purchased, they should be placed where they are to remain, the very evening after they have swarmed.

It matters not whether hives are straw or wood, except as to price.

Straw hives are recommended to be made the shape of a half-bushel measure; nine inches deep, twelve inches across, and flat on the top, with a hole four inches round; this to be covered with a piece of straw, an inch larger all round than the aperture. This, in favourable seasons, can be removed, and a small hive placed on the top.

Small hives, for the top, may be glass, or wood, or straw. If glass, it is to be covered to exclude the light, and in severe weather there should be warmth in the covering.

The very best covering to protect a hive from wet is a milk-pan reversed.

When this small hive is filled, it can be removed and replaced with another. It is first lifted, and the empty hive which has a hole on the top is put between the full hive and the stock-hive, and ultimately remove the full hive altogether.

Wear thick worsted gloves in preference to leather ones in all operations among bees. If they attempt to sting they cannot withdraw it from leather, and many thus perish. Quietness, coolness, and confidence, are the best protection. To breathe on them is highly irritating and offensive.

When the small hive is lifted, and an

empty one placed between that and the stock, it should remain some days, until it is presumed the bees have left the top one. It should then be lifted off very gently, and placed within four or six inches of the table or ground, propped up by bricks, or a similar contrivance. A loud humming noise is first heard, and the bees are seen to leave it in a few minutes; but should the queen be in the box, all will be quiet, and the principal hive will appear in confusion. In this case it should be returned to its place a day or two, and then attempted again.

Autumn and spring are the most proper seasons for supplying weak stocks with food. Bees should never be fed in winter.

Let a dish or soup-plate into a piece of flat wood, so that the rim is flush with the board. Fill this with honey, and put pieces of paper on the surface to prevent the bees sinking into it. It may be placed under the hive at sunset, and removed at sunrise.

Moths are the greatest enemies to bees, except their possessors, who often do as much mischief by tormenting and mismanaging them as vermin do. In the caterpillar state the moth will sometimes attack and destroy a whole hive. The best preventive is the frequent cleansing of the hive floors, for the female generally deposits her eggs between the hive and the board on which it stands, or in the dust that accumulates at the bottom.

The blue titmouse destroys a great many. One will kill and afterwards eat the bags of a dozen at a time: destroy their nests in breeding time.

Bees should be hived directly they are swarmed, and not be left till the evening, as is too much the practice.

Never put sticks across the inside of a hive; it has been found troublesome, useless, and is discontinued by all good managers.

POULTRY KEEPING.

Although Poultry keeping may not be advisable in an allotment unless the fowls are prevented from wandering, yet the cottager will find his account in it at home. The following hints may be useful. The system is pursued in America with great success.

Never allow more than twelve hens to one rooster, a smaller number, say eight, would perhaps be better.

Never allow the roosters to go together; they are very jealous, and always pugnaciously interfering with each other's rights. The strongest lead away the hens; the consequence is, the eggs are fewer, and do not hatch so well. A large number of hens is not so profitable, in proportion, as a smaller number.

Chickens require a great deal of water to soften their food, and gravel to grind it.

They also require animal food. In winter they often cannot get water nor gravel, nor insects nor worms. They are all fed, it may be, with grain, yet do not lay. Give them water, gravel, and animal food, such as fat meat, liver, or indeed any kind of fresh meat. Keep them warm, not permitting them to become chilled, and they will lay as well during the winter as in any season.

Do not permit your hens to sit at different times, or rather only a few at a time. This causes broods of different ages, and the younger are usually injured or deprived of a fair quota of food by the older. When your hens manifest a disposition to sit, let them remain on chalk eggs until as many as you intend to sit are ready. Then place fifteen fresh eggs under each hen.

When the young are hatching, do not interrupt the hen. When hatched, feed them with Indian meal, with a large portion of pounded egg shells. Hens that "sit out," as it is called, generally have healthy chickens. I often have examined their nests, and seldom found any remains of the shell in them. The little ones eat them up. I have found that egg shells greatly advance their growth and health.

If all the little chickens could be taken from the hen, and kept in a room warmed by a stove, I am satisfied from experiments that they would do much better than to be with the hen.

Never allow the young chickens to get wet, nor to become cold. See that they are supplied with ground worms (fishing worms). They will repay you for this trouble.

The following outline from Glenny's *Garden Almanack* for the year 1848, is worth quoting, because, like the rest of that work, it is very comprehensive and very short, and besides which, it comprises all the sorts that can be profitably kept.

Fowls.—The common fowl is perhaps nearly as valuable as any. The grey Dorking, and the black Spanish sorts, are, however, to be preferred to all others, when they can be gotten pure. Both these kinds are good layers, give large eggs, readily fatten, do not stray far, and command a high price in the market. All fowls having white legs are to be preferred; long-legged fowls are not worth keeping. Fowls fatten best when confined, and they also then require less food; but they must be kept warm. The nests should be placed in the hen-house, and as far removed from the roosting-place as possible. Baskets are better than boxes. A little straw only is necessary, and let it always be kept fresh and clean. Nothing contributes more than warmth to the hen's laying plentifully; and a good short-legged hen, if well fed and kept warm

and undisturbed, will produce 150 eggs, besides bringing up a brood of chickens, every year. If six hens be kept to one cock, they will be more prolific than when the proportion of females is greater.

Ducks.—If there is a pool or stream in the vicinity, ducks should certainly be kept. The ducklings must not be allowed to go much into the water till they are about a week old, as they are apt to die from cold. Except attention for the first few days, they require little feeding or care afterwards; and if a common be near, they will shift for themselves, worms and insects being their favourite food.

Turkeys are great feeders. If you set the eggs under a common hen, and keep her confined, allowing the young birds to run about, and vary their food by feeding them upon chopped nettles, buttermilk, curd, and oatmeal, they will thrive well.

Geese require little care. Where there is water, or a common for them to feed on, they may be profitably reared, and with very little trouble, and the feathers are always valuable. When first hatched, do not let them wander far, but the old goose must not be shut up. A yard or empty barn is the best place for the goings the first week, letting them out two or three hours each day to feed on grass. When fattening for the market at home, feed them on raw turnips chopped, and water, with very little corn.

The advantage of keeping poultry is greater to those who have a garden than to those who have not, for although they may not be introduced to the growing crops, there is a great quantity of waste that is well applied to the feeding of poultry.

KEEPING PIGS.

To those who have a garden this seems almost a natural consequence, and under judicious management costs but little, because all the while a pig is growing to his size he can live on the garden waste, or very little more; and he tramples and dungs among that which he does not eat, and so increases the manure for the garden. When the time for fattening comes, he still takes a great deal of nourishment from the garden produce, independently of the food which is given to bring him to his weight. Pollard, wash, boiled vegetables, and peas, cost but little, compared with the value of the meat they make, if they are not given too early, and the animal is kept up close while fattening. From the *Almanack* we take—

A FEW GOOD SORTS OF PIG TO CHOOSE FROM.

The China pig is of Chinese origin. It is short in the head, with pricked-up ears, full wide checks, high in the chine, and very short legs. This breed is very prolific. The pigs

easily fatten, although they do not grow to a great size, and may be killed for bacon when twelve months old.

The Neapolitan pig is black, without any hair, and very plump, with pricked ears. It fattens as readily as the China breed, but is not so prolific, and is more tender.

The Suffolk breed is generally white, with pointed ears, broad chest and loins, and short compact form, much resembling the China sort. They make fine bacon pigs, weighing

from twelve to fifteen score at twelve or fifteen months old.

The Essex pig is for the most part black, or black and white, with little hair, and in form and character bears a strong resemblance to the Neapolitan breed. It fattens very readily, and at an early age.

The Berkshire pig is a well-shaped animal, having small pricked ears, broad chine and loins, good hams, and short legs. This is a very valuable breed, and second to none.



STERIPHOMA PARADOXUM.

STERIPHOMA PARADOXUM, *Endlicher* (paradoxical Steriphoma).—Capparidaceæ § Capparea.

This plant belongs to the same group as the plant which produces the capers of the shops. It forms a bushy tree, of very distinct habit and appearance, growing from six to eight feet in height. The branches are clothed with a pile of short stellate hairs, and bear alternate leaves, which are of a lance-shaped figure, from four to six inches long, and one inch in breadth, and are attached to the stem by means of long stalks or petioles; the colour of the leaves is a deep green, which adds much to the beauty of the plants by its contrast with the gay colour of the blossoms. These flowers are borne at the apex of the shoots, in dense racemes, the peduncles being crowded, and very erect, and the flowers so attached that their apex points downwards; the calyx is cup-shaped and two-lobed, the anterior lobe being smallest; it

is of a rich russet orange yellow, the surface being covered with a short velvety pile of stellate hairs; within this calyx are situated four oblong petals, which project beyond the calyx, and are of a fine sulphur yellow colour; the stamens, six in number, project as much as two inches beyond the petals, and are curved upwards, as also is the style, which exhibits a peculiarity seen among plants of this order, in bearing the fruit at the end of a long stalk-like extension of the disc, which is technically called the gynophore; in the present instance, for example, the berry seems as though it were projected on a slender stalk, some two inches from the flower, instead of being, as is more usually seen, either within or behind the flower. The ripe fruit attains some size and length, and is of a cylindrical figure.

The plant is not yet in English gardens, but has been introduced by Dr. Karsten to those of Germany. It was found by him in

travelling from Mayquetla to Caraccas, growing at an altitude of from one thousand to two thousand feet, in a rich, dry, and hard loamy soil. They were flowering there in the month of April in a mean temperature of from 18 to 19 degrees Reaumur, (about 75 degrees Fahr.) The appearance of the plant was very striking.

We believe no plant of this genus has ever been cultivated in English gardens. It will require, as intimated by the figures above quoted, the temperature of a stove, and should, at least while growing, be placed in a thoroughly tropical atmosphere, that is to say,

where the heat will not be deficient, and moisture in the atmosphere abundant. It requires these conditions. A rich loamy soil, well drained, should be given to it, and a moderate share of pot room. After its growth is completed, it should be kept rather drier and cooler, but should not be removed from the stove. Propagation may doubtless be effected, as in some allied plants, by means of cuttings planted in sand, under a bell-glass, and placed within the influence of a slight bottom heat.

Our illustration is derived from Dr. Karsten's work on the plants of Venezuela.

THE GOOSEBERRY, ITS PROPERTIES, CULTURE, AND MANAGEMENT.

THE principal properties of the Gooseberry are weight, flavour and form, thin skin, small seeds, and rich pulp. The form should be circular, compressed orange-form in preference to oval. These points may not all be agreed to in the Gooseberry countries, nor be acknowledged by the present Gooseberry judges, but we are rather accustomed to be opposed by old prejudices, and therefore bide our time for the period in which the fashions so long prevailing shall give way to common sense. The skin should be hairy for show, upon the same principle that a cucumber should have spines, and the thicker the hairs the more handsome the fruit. There are many ways of promoting the growth of large fruit, but the chief consists in thinning the berries until not more than one is left on a branch, and even this to make it weigh is fed from a saucer filled with water fastened up to it, so that the snuff or nose of the berry touches the liquid. There is, however, a good deal to be done towards producing excellent fruit, without going to the extreme of the toil which is undertaken by exhibitors. We will commence this paper by giving a list of the heaviest gooseberries that have appeared at any of the leading exhibitions, and all the varieties that have been awarded prizes, with the number of first prizes, total number of prizes, and the weight of the heaviest berry; for to any one who proposes to cultivate the fruit, an account of the names and weights will be a good guide to select by.

RED GOOSEBERRIES, 1847.

Name.	No. of 1st Prizes.	Total No. of Prizes.	Heaviest Berry. dwt. gra.
London	110	360	28 0
Companion	9	166	25 0
Conquering Hero	2	159	25 13
Wonderful	14	153	27 23
Slaughterman	5	121	25 4
Leon	2	107	23 8
Guido	0	47	21 16
Lion's Provider	0	38	25 16

Name.	No. of 1st Prizes.	Total No. of Prizes.	Heaviest Berry. dwt. gra.
Magnet	1	35	22 8
Briton	0	33	21 19
Napoleon le Grand	1	26	20 11
King Cole	0	26	23 15
Jumper	0	22	21 9
Twig'em	0	21	22 12
Defiance	0	14	22 6
Atlas	1	9	21 3
Stewart	0	8	18 17
Top Gallant	0	7	22 2
Highlander	0	7	26 8
Lincoln	0	5	23 0
Red Peacock	0	5	22 2
Lord Middleton	0	4	18 15
Plumper	0	3	22 1
Prince Albert	0	3	20 0
Wallace	0	3	19 10
Don John	0	3	19 12
Black Prince	0	3	18 18
Sam Hunter	1	2	21 14
Give it a Name	0	2	24 0
Old England	0	2	20 13
Top Sawyer	0	2	18 14
Mistake	0	2	19 8
Echo	0	2	19 12
Long Jack	0	2	20 9
Caledonian	0	2	17 13
Wistaston	0	2	16 19
Ironsides	0	2	17 10
Conductor	0	2	19 10
Captain Ward	0	2	16 4
Commander	0	1	18 0
Statesman	0	1	15 17
Manchester	0	1	17 4

YELLOW GOOSEBERRIES.

Leader	42	187	27 0
Catherina	46	159	25 1
Pilot	14	129	23 0
Broom Girl	7	87	21 18
Gold Finder	6	78	22 0
Gunner	2	72	20 16
Drill	6	67	24 14

Name.	No. of 1st Prizes.	Total No. of Prizes.	Heaviest Berry. dwt. grs.	Name.	No. of 1st Prizes.	Total No. of Prizes.	Heaviest Berry. dwt. grs.
Peru	5	62	22 17	Rough Green	0	7	16 4
Railway	2	55	22 22	Green Snake	0	7	17 3
Two to One	3	49	20 2	Away-she-goes	0	6	18 12
Dublin	2	36	22 5	King William	0	6	17 6
Glory	0	26	21 4	Lord Crew	0	5	15 22
Marigold	1	25	20 22	Hollin's Green	0	4	16 9
Birdlime	1	25	19 14	Travelling Queen	2	4	17 9
Forget-me-Not	0	18	21 4	Bell's Gift	1	3	20 13
Colombia	0	16	19 0	Myrtle	0	3	22 3
Creeping Jane	0	14	19 12	Forrester	0	3	15 21
Shuttle	0	14	19 14	Peover Ranger	0	3	16 4
Jubilee	0	13	19 12	Tom Joiner	0	3	17 2
Teazer	1	13	18 12	Wood's Delight	0	3	17 6
Game Cock	2	10	20 10	Royal Blade	0	3	16 0
Chief	0	10	19 12	Miss Sarah	0	3	19 4
Lord Ranccliffe	0	9	20 10	Ince Pet	1	2	20 18
Duckwing	0	7	18 13	Dean Swift	0	2	17 0
Attila	0	6	19 18	Rocket	0	2	16 3
China Orange	1	5	17 13	Morning Star	0	2	15 18
Betsy	1	4	18 18	Turkey Cock	0	2	19 0
Ready	1	4	18 23	Off-she-goes	0	2	16 17
Lightning	1	4	19 14	Green Briton	0	1	19 9
Golden Hero	0	4	16 18	Bang Europe	0	1	15 16
Publicola	1	3	15 8	Ocean	0	1	14 4
Deckander	0	3	18 0	Green Room	0	1	14 12
Pigot's Folly	0	3	16 10	Sea Horse	0	1	13 8
Strength for Weight	0	3	16 6	Victory	0	1	13 16
Oakmere	0	2	19 3	Angler	0	1	15 2
Rockwood	0	2	16 12	Green Meadow	0	1	15 6
Woodman	0	2	14 0	Favourite	0	1	15 21
Bowden Lass	0	1	13 2				
Great Western	0	1	15 12	WHITE GOOSEBERRIES.			
Bonny Bet	0	1	14 0	Freedom	40	187	23 9
Bright Yellow	0	1	11 22	Queen of Trumps	28	147	22 9
Mr. Rutter	0	1	15 17	Cossack	10	97	22 16
Yellow Boy	0	1	17 6	Tallyho	13	95	23 10
Husbandman	0	1	20 1	Eagle	6	91	21 8
Chance	0	1	16 23	Lady Hester	7	88	21 8
				Snowball	8	84	22 10
GREEN GOOSEBERRIES.				Lady Stanley	8	67	21 0
Thumper	78	247	25 0	Coppin Lass	3	44	20 15
Turn Out	6	105	20 23	Miss Walton	3	33	19 21
Over All	11	98	23 9	Philip the First	0	26	21 11
Weathercock	14	97	22 18	Flora	0	23	21 8
Providence	5	78	20 16	Snowdrop	4	22	21 3
General	2	69	22 2	White Hare	2	21	20 12
Peacock	2	67	20 11	Ostrich	1	17	21 16
Queen Victoria	8	84	21 16	Ardsley Beauty	0	17	17 8
Keepsake	8	58	20 0	Bee's Wing	0	16	20 20
Green Prince	1	42	20 16	Fleur-de-lis	0	15	18 23
Green River	1	35	20 1	White Swan	1	13	18 9
Little Wonder	0	30	18 17	Morton Lass	1	12	18 23
Invincible	1	27	20 8	British Queen	2	11	18 14
Bumper	3	26	22 23	Mrs. Scarisbrick	0	10	18 7
Random Green	2	20	19 5	Foley	0	7	22 12
Lancelot	0	17	18 14	Chorister	0	7	18 6
Banksman	0	16	17 10	Bloomsbury	0	6	19 15
Thunder	0	14	18 22	Alice Hawthorn	0	6	18 12
Green Wonderful	1	8	19 0	Nonpareil	0	6	17 5
Great Britain	0	8	19 9	Country Lass	0	4	18 0

Name.	No. of 1st Prizes.	Total No. of Prizes.	Heaviest Berry. dwt. grs.
Fair Ellen	0	4	20 6
Eagle's Daughter . . .	0	3	17 6
White Lion	0	3	16 8
New Chapel	0	3	19 12
Miss Hammond	0	3	15 16
Queen Dowager	1	2	18 0
White Whale	0	2	18 2
Harkaway	0	2	19 10
Honour of Tickel . . .	0	2	15 0
Lily of the Valley . .	0	2	14 17
Lady Delamere	1	1	17 14
Eliza	0	1	18 18
Glory of Houndsdale .	0	1	15 10
Competitor	0	1	15 11
Whitesmith	0	1	16 0
Lady Wood	0	1	12 18
Louder	0	1	14 21
Thrasher	0	1	17 0
Princess Victoria . . .	0	1	16 10
Nancy	0	1	15 11

The foregoing summary of what first prizes, and the total number of prizes of all sorts, that each variety has won, is taken from the *Gooseberry Growers' Register* of all the different gooseberry shows, and is made up from the winning lists. It will be seen that the number of first prizes does not always bear a proportion to the number of prizes won altogether. We have not taken any notice of the second, third, fourth, &c., but have given merely the total number won. The list includes all that have won at all. To this we will merely add, from the same excellent little work, a list of new ones to come out:—

John Harrison . .	Yellow.	Climax.
John Locket . . .	White.	Jenny Lind.
Charles Leicester .	White.	Madame Vestris.
Thomas Cook . . .	Yellow.	Captain Cook.
John Boots	White.	White Hart.
George Williamson	Red . .	York.
Edwin Oxley . . .	Green .	Liberty.
John Henshaw . .	White .	White Cockade.
Joseph Fenney . .	White .	Queen Mary.
Ditto	White .	Miss Long.
Francis Fillon . .	White .	Seedling (not named).
James Rhodes . .	Yellow.	Oldham.
William Mother . .	Green .	Hope.
Daniel Moore . . .	Red . .	Tony Lane Hero.
John Thewlasse . .	Green .	Admiral.

These seedlings are, for the most part, different and superior to the majority of the above, though some of them cannot be beaten; and by comparing the number of prizes won by each, and the weight of the berries, these particulars will enable a grower to select and order. All or any of them can be had of Holland, Middleton, near Manchester, or of Watkins, in the Market-place, Manchester.

SOIL AND SITUATION.

The gooseberry is by no means a dainty subject, any strong garden soil will bring it in perfection; but loam and dung are excellent, and whatever the soil be naturally, it must be made strong with dressing. Their situation should be open and airy, and if shaded by distant trees a little, so much the better, but it must not be so underneath as to catch the drippings from the branches; they must also be dunged every year, to be brought to perfection.

PROPAGATION BY CUTTINGS.

At the cutting of the trees in autumn, the ripened wood should be cut up to a joint at the bottom, and the length be adjusted to six or eight inches; four inches may be planted in the ground, and four out of the ground; these should be inserted in beds three inches apart in rows, and the rows about nine inches apart, to enable the operator to clear the weeds out more readily; otherwise, for merely striking root, they might be still closer; these will strike root and grow in the spring, and be ready to plant out in nursery rows in the autumn, when they may be put out in fresh-dunged ground, a foot apart in the rows, and two feet from row to row. Before this re-planting, the shoots may be cut back to two or three eyes each; and as they make their fresh growth, the branches that are coming so as to cross others, or be in the way, may be rubbed or pinched off before they have made any growth. Here they will make strong growth during the second season, and at the second autumn may be regularly pruned, and allowed only one more season's growth, when they will be in perfection for the final planting, and may be removed for that purpose from October to early in the spring, but the earlier the better.

PLANTING OUT.

The planting out is subject to the whim of the cultivator; but the best disposition of the trees is to plant rows where they may form a boundary to different crops; say that rows of gooseberry bushes parted the garden at every three or four rods distance, or at every place where a division was desirable, or formed the boundary next the walks; no matter how or where they are planted, so that they are allowed room to grow. Some plant a regular quarter with bushes. In this case the trees are six feet from centre to centre in the row, and the rows ten feet apart; but we think rows away from each other are far better in family gardens, although market gardens, perhaps, have whole quarters of several acres planted throughout. When they are planted, the roots are preserved whole, and the holes dug sufficiently large to allow them to be spread out,

and not cramped. They are by no means to be planted deeper than they were in their nursery bed; and as they have a year's growth upon them since last cut in, they want pruning; and this work requires some little care. It will save trouble, if they are pruned before they are trodden in to their places, and they are less likely to be disturbed.

PRUNING THE BUSHES.

The pruning in winter time consists of cutting out all the little weakly shoots, all shoots that would cross other shoots, leaving on each main branch such laterals as are strong, to the extent of not more than two or three on a main branch. The end or leader of each limb should be also left, if not too straggling; if it be longer than is proportionable for the rest of the tree, cut it back to a good lateral branch; it is better than having them too long and straggling.

In future years the pruning for general crops merely consists of cutting out all the numerous weakly lateral shoots, and cutting back all but three or four to each strong branch. The fruit comes on old as well as new wood; spurs, therefore, of an inch long will produce fruit, but for the gooseberries, the last year's shoots are the best; and the two, three, or four of the strongest left on the main branches will bear the finest fruit. In summer time, then, cut the young wood, that it may not crowd the tree, shade the fruit, and weaken the general wood. It is of the greatest importance to let in the sun and air.

THINNING THE FRUIT.

For family purposes, the fruit should be thinned as soon as they are as large as good peas. They will make tarts even then; but if not considered worth using, they are better off the tree than on. The berries should not be allowed to be nearer than an inch apart; and when these have all swelled to a size fit for use, let two of every three come away, so that not more than one should grow to every three inches of stem. Attention to this thinning operation should be paid in time. And if gooseberries of extraordinary size are required, not more than one handsome berry should be left on each main branch, and that on the strongest of the laterals that proceed from it, so that, in fact, not more than half-a-dozen is allowed to ripen on a tree. Many gooseberry trees have singular habits, and the pruning must always be managed to turn the habit to the best advantage. Some throw out long horizontal straggling branches, and these are held up from the ground with little forks of wood, stuck in the ground, to prop them up; but the fruit left to ripen must be so firmly fixed, or rather the branches on which they hang must be so firmly fixed, that no wind can stir

them; and the fruit must, when nearly ripe, be supplied with water from a small vessel, into which the snuff, or brown nose of the fruit, must hang and touch the water.

STANDARD GOOSEBERRY TREES.

Nothing is more easy to train than standard gooseberry trees; and they are very proper in gardens where room is an object. They are trained even from the cutting, on purpose to form a long stem. The strongest shoot is selected, even when the cutting is pushing, and the rest are all taken off, that the entire strength may be thrown into this one shoot. At the autumn, when the cutting is planted, it must be so sloped or contrived that the strong shoot shall be upright. The second year, the side shoots are to be taken off as they come, that all the growth may be in the leader; and this being loosely attached to a straight stake, will continue to grow upright. All the side shoots must be continually removed; and when the growth is high enough, the top may be pinched out, and the side or lateral shoots, that come where the head is to be formed, may be allowed to grow. In the autumn of that year, each of the lateral shoots must be cut back to two or three eyes, and the next year's growth may be considered the head, which is to be treated the same as a bush on the ground, except that its height may be curtailed a little if the branches shoot upwards, although the advantage of having the ground clear is greater than the disadvantage of getting up to gather the fruit. A row of standard gooseberries, whose heads are five or six feet from the ground, scarcely interferes with a crop, certainly not for the worse with some crops, while the same heads close to the ground would waste three or four feet on each side the stems.

DUNGING.

The gooseberry requires digging round and dunging every year, if the fruit is to be produced fine. The market gardeners dung close up for their under crops, and therefore constantly keep up the dressing they require; but it is better to fork up all round the bushes, and lay on the dung, to be washed in with watering or rain, or both; because it reaches the fibres at once, and the forking does not damage them, whereas the constant digging between the rows in a market garden cuts off the fibres near the surface, drives the roots down deeper in the ground, and they do not feel the warmth of spring half so soon as if the surface was merely forked, without disturbing the roots, and the dung washed into them.

RAISING SEEDLINGS.

The finest berries should be selected for seed. The seed should be sown in the autumn

of the year they are gathered in. A clean piece of ground should be selected, the seed dried, and sown thinly, and carefully raked in. They will be up strong in the spring, and when large enough may be planted out, six inches apart; or, which is better, all those that are nearer than six inches apart may be removed, to give room; and those so removed planted out, while the others are left in the seed-bed. At the end of the first season they

may be taken up, pruned, and planted out in nursery beds, two feet from row to row, and eighteen inches apart in the row. Here they may be pruned every year till they bear, and show whether they are worth naming or keeping. If they are, let them be propagated the same as the named varieties; and be treated in all respects like the approved sorts. The seedlings require no nursing, for they are as hardy as established trees and bushes.



THE CUCKOO.

CUCULUS CANORUS. (Linn.)

"THE Cuckoo is so well known to every one, that we need only to remark, that, besides visiting the British Isles, this bird is met with as far north as Norway, during the summer, in Europe. Asia, and many parts of Africa, are also enlivened by its pleasing mellow call-note. The Cuckoo makes its appearance with us in the month of April, and is generally either the forerunner of summer weather, or travels hither with it. The male is generally a day or two in advance of the female. Their journey is performed during the night; and they frequently return to take up their abode in the neighbourhood occupied by them in a former season. The locality usually chosen by the Cuckoo is wherever there are trees, without being at all particular as to the species, or of what age or size they may be. We have seen these birds most numerous where hedgerows are very thick, and plentifully intermixed with forest or timber trees, about rich pasture land and in sheltered and secluded situations; but more than one pair is rarely seen within the bounds of a certain district;

for though these birds will live peacefully as neighbours, yet they do not allow of trespassers on their hunting-grounds, and intruders are generally punished for their temerity. The Cuckoo is a wild and timid bird, very strong on the wing, but when on the ground apparently helpless and clumsy. It therefore suits this bird better to fly even a short distance, than to reach it by hopping on the ground. Its perch is generally on a strong branch of a tree, or occasionally on a post or gate in a field, from whence the Cuckoo can look out for its food or enemy. In case more than one pair of these birds are frightened, or started on the wing, they show their unsociability very much by not flying away together, like most other birds, but each pair separates from the rest, and takes its own course, although the female is never far behind the male, who is careful not to desert her. The flight of the Cuckoo resembles that of the sparrow-hawk; it is scarcely so rapid as that of the pigeon; but it excels in making short turns, or evolutions.

"The well-known pleasing call of the Cuckoo, in the spring of the year, stands in the place of the song of other birds, and helps to complete the concert of Nature. This call has furnished the bird with its name, after the manner of the "sweeps" and "old clothes" men. When the bird is courting, and gets in ecstasies, it sometimes lengthens its call to *cuckoohook*, and this is frequently twice or three times repeated. In the pairing season, the Cuckoo begins its call soon after midnight, and repeats it more than a hundred times in succession, without changing its perch; after which it rests for a time, recommences, and then again rests, and thus continues until the morning light reminds the bird that the time has arrived for him to break his fast, and he then starts off on the wing in search of food. These birds also call out while flying high in the air; and they produce a sound like *grwa, wa, wa*, which is considered by some as an indication of the near approach of rainy weather; but whether this opinion has any foundation in facts we will not undertake to determine. The Cuckoo feeds on insects and their larvæ, by choice, however, on hairy caterpillars in all stages, cockchafers, grasshoppers, butterflies, and moths; and, like the hawks and owls, the Cuckoo casts up the indigestible parts of its food, in the usual form of pellets. Young birds may be brought up with raw meat when kept in confinement, although they are not worthy of the great trouble they occasion. The fact that the Cuckoo does not build a nest for itself, and that several small birds that feed upon insects are made to hatch its eggs and to bring up its young, is sufficiently established.

"How the female Cuckoo manages to deposit her egg in the nest of another bird has not been satisfactorily described: so much, however, is known, that the female goes singly about this business, without her mate being near; but whether this is for the purpose of watching her opportunity, or for going more stealthily about her designs, is still an unanswered question. The number of eggs deposited by the Cuckoo during the season varies from four to six; but these are laid at such distant intervals, that some may be found in May, and others as late as July. It is insisted on by some persons, that the Cuckoo sucks the eggs of other birds; and to strengthen this assertion, they state that they shot a Cuckoo that was actually in the act of carrying off an egg; the most probable explanation of which is, that the female Cuckoo was carrying her own egg, which she had laid on the ground, to the nest of some other bird; and although no one has hitherto been able to detect the whole of the proceedings of the Cuckoo, it is possibly by these means that her egg is smug-

gled into the warbler's nest. The egg of the Cuckoo is very small in comparison to those of other birds of its size; but the reason for this is obvious, and it must be considered as a beautiful provision of nature. The egg of this bird is readily distinguished from all others by the black specks and scratches on its surface. It is very wonderful that small birds of divers kinds should be so far imposed upon, as to spend their time and affection upon such a disproportionately large and unsightly thing as a young Cuckoo: we have watched them, however, and have ascertained the facts, even with a mature yellow bunting and a young Cuckoo in a cage.

"The Cuckoo measures, from the tip of its beak to the extremity of the tail, thirteen inches and a half; the wing, from the carpus to the tip, measures eight inches and three-quarters; the tail, six inches and three-quarters; the beak, ten lines; and the tarsi, ten lines and a half. The iris, corners of the mouth, and legs, are full yellow or pale orange; the eyelids are of remarkable beauty, being so transparent, that, when closed, the colours of the pupil and iris can be distinctly seen. The head and all the upper parts are bluish-ash coloured; the throat and forepart of the neck and breast the same. The quills and tail are dusky; the inner webs of the quill-feathers are beautifully barred with oblong pure white spots, from the root of the feathers to within an inch and a half of their tips. The rump is bluish-ash coloured, which colour also extends over part of the outer edges of the webs of the middle tail-feathers. The tail-feathers are spotted with white along their shafts, and the tips of them are all white. The under parts are all white, barred transversely with dusky. The under tail-coverts are tinged with yellowish rust colour. The bill is dusky yellow at the base, the inside is orange. The young bird is brown all over, the upper parts barred with red, brown, and white; the under parts are dirty white barred with black; the quill-feathers are spotted with red brown, and the tail the same. The iris of the young bird is dusky."

We give the foregoing as a fair sample of the letter-press of Meyer's beautiful work on *British Birds*,* the coloured illustrations of which are admirable.

ABERCROMBIE'S EVERY MAN HIS OWN GARDENER.

A NEW edition of this popular standard work is a sort of advent in the gardening world,

* "Illustrations of British Birds, and their Eggs. By H. L. Meyer. London: Simpkin, Marshall and Co."

and we hail with pleasure the twenty-fifth, which has just appeared, with notes, corrections and additions, by *G. Glenny, F.H.S.* We always look to this single book as the original of nearly all the trashy calendars in existence, from the earliest imitators, who said nothing, to Mrs. Loudon, who abuses all, and of course this among the rest, as imperfect. Thousands of gardeners have taken their earliest and best instruction from Abercrombie, and as it spread far and wide it became known as the most complete and the easiest understood book of the day. The quaintness of the style, the clearness of its reasoning, and the completeness of its lessons on general gardening, won it friends and admirers among all classes. Its very redundancy was calculated to enforce on the mind of the reader the plan and principles which the author endeavoured to teach. The thousand and one treatises that have been built up with materials from this work, without the slightest acknowledgment, would be only so many evidences of its utility; and whatever may be said on behalf of those few which are tolerable from having treated of subjects more recent than the date of Abercrombie, there is nothing in the very best of the works of the last fifty years that gives us a better notion of the general science of gardening than the work under notice. The twenty-fourth edition was edited by Main, who introduced a good deal of useful matter, without disturbing much of the original; and the edition before us is something the better for correcting some of the crude notions entertained by the numerous persons through whose hands the various editions have gone from time to time. Mr. Glenny has left the quaint style of the work untouched; he has, it is true, taken away a few redundancies, and his notes comprise sundry short instructions with regard to florists' flowers; and as in certain points the practice has in some measure altered by the addition of conveniences not in existence a few years ago, he has here and there disputed a point instead of changing the text. The introduction to the twenty-fourth edition was a complete treatise in itself, not without its faults. It assumed the form of a review of the progress of the science, with occasional unmeaning compliments to people whom accident had brought into notice, or some friendly feeling had favoured, not only among botanists but gardeners. Some very ill-digested observations on landscape gardening, which was treated as a sort of mystery, pretended to set us right, and open to our view, in a sort of homily, all that was essential to a full understanding of the subject. Mr. Glenny has preserved all the useful parts of this introduction, denuding it of that which was im-

pertinent and erroneous. The compliments are cut out, and a long lecture upon the necessity of botanical knowledge, and the acquirement of different languages as a prelude to the innocent amusement of gardening, and in which the author totally forgot that the work was written for the million, for "every man," instead of for the professional gardener, has been very properly displaced to make room for better and much more useful matter. Mr. Main's introduction is greatly improved by the operation; for, independently of the points we have mentioned, he was almost ridiculous on the subject of landscape gardening, actually recommending the study of landscape painting instead of nature as essential to a gardener. This is judiciously omitted. In short, all the good is retained, the few disputed points corrected by notes, and that only which was out of character in a work for the multitude has been excluded. Mr. Main says, "a serpentine walk by the side of a house or a fence is a manifest incongruity." Mr. Glenny says, in a note, "We take leave to dispute this, because irregular planting will always get rid of straight lines, but a serpentine walk, geometrically true, is as objectionable as a straight line. It is, however, quite practicable to form a landscape garden between four brick walls." But on the subject of landscape gardening, Mr. Glenny has given what we have no hesitation in saying is the best lesson on landscape gardening that was ever comprised in so small a compass, and we must take it whole, as a specimen of the short essays which are added to the work. He observes,

"It has been already said that 'a pure taste in the disposition or arrangement of land, wood, water, and buildings, in a real landscape cannot be well transferred in writing from a master to a pupil;' but there are certain rules which can be transferred, and which every one forming a landscape garden may profitably bear in mind. In the first place, nature should be imitated in all her most pleasing features only; and in the next place, as many of these pleasing features as possible should be brought together so consistently as to harmonize well. It is not enough to make a serpentine road, and to stick about at random clumps of trees. This would be, or rather might be, done so as to produce effects as ugly and inconsistent as possible. A road ought never to be straight; nature affords us no such feature, or if she did it would be considered that nature was out of character: but if roads curve here, and sweep round there, you will find some cause for it. It may be said nature makes no roads: but she points out very distinctly

where they are to be made; those who have to travel go as straight as the nature of the scene enables them; they do not cross a high mountain from choice, they will swerve to go across the lowest portion; people do not go through a wood when they can go round it, nor do they go down a hole and up again, or through water, when they can go by them. In forming a landscape garden, therefore, the road should be carried in graceful sweeps round the space to be laid out, sometimes close to the boundary, at other times some distance from it; but having done this you must make excuses for it: clumps of shrubs, or ornamental water, or mounds, must be put in such positions as to make it appear that the deviation from a straight line was caused by the obstruction. All clumps should be within the distance that implies the road comes as near as it could to the plantation. All the chief planting should adjoin the road or the outer boundary fence, or be sufficiently near it to form a feature with it, and it should be in masses and not in frivolous little groups and patches. If a place be ever so small it should be planted as a portion of a large one. Nothing can be worse than doing things on a small scale to get more features into a little space than is consistent: by the same rule, let a large place abound with pretty spots which would look well if cut off from the entire estate. In small places always plant the outer masses so as to conceal the real extent of the premises; this is easily done by forming apparent outlets, the ends of which cannot be seen, and consequently giving the same effect as if they reached three miles instead of three yards, or perhaps less. Water should never be straight any more than roads; and if there be a canal of this description, open out a large space here and there, and entirely break all signs of a straight margin—and let this be done on both banks of the canal. Besides this some judicious planting at particular points will greatly aid the same effect. It has been said that a serpentine walk will not do by a straight building; but this is an egregious mistake, because we have nothing to do in such case but to plant irregularly along the straight line, that is to say, plant in some places a few feet only in thickness, in other places thirty or forty, preserving the massive appearance by making the uneven outline nevertheless whole, that is, the narrowest part to swell out gradually, not abruptly, to the wider or the widest, as the case may be. Again, in landscape gardening the belts of plantations outside, whether the boundary be straight or crooked, should not be even, nor composed of one sort of trees, nor be planted at equal distances; nor, unless there be an object in

shutting up the place from public view, should the planting necessarily be all continuous. If there be any fine view, it would be folly to close up the place: either lower the planting and have the shortest shrubs, or discontinue the plantations for a length or two; but this must be dependent on the owner. Many insist on shutting out the public by a broad belt all round, but if there be no variation in breadth or height, it is not landscape gardening. The masses of planting inside a road, that is, the side next the mansion, should be sufficiently dense to occasionally shut out the view of it along a portion of the drive; and specimen trees or small groups of trees may be planted at a short distance at the places where there is none adjoining the drive, so that the opening as it were should be partially relieved. A thousand circumstances may require a particular exercise of taste; but, as general rules almost without the chance of exception, these should always be borne in mind, whether in the improvement of estates which have been neglected, or the original laying out of the grounds round a mansion."

Here are general rules which even a novice can follow with advantage, and which landscape gardeners may be none the worse for reading. We have seen some not very ancient landscape gardens by Loudon, Major, and Ramsay, in which the application of these simple rules would have been of the greatest possible advantage. The Arboretum at Derby, the parks at Manchester, and a few things on a smaller scale, would convince any unprejudiced person that we are not far from right in this matter. Nevertheless, there is much to admire at Manchester that is perfectly consistent with Mr. Glenny's notions of landscape gardening, though he does not follow the old writers nor the modern teachers of the art. A pure taste cannot well be transferred in writing from a master to a pupil, it is true, but the rules that pure taste should follow may be, and practice, and the satisfactory result, may in time give the pupil the natural taste. In education it is as necessary to teach what should be avoided as what should be done; habit and disposition, natural genius and perseverance have a good deal to do with success.

Mr. Glenny's chief alterations are in the catalogue of plants and fruit, which professed to be a selection of the best. Here there has been great improvement, and in introducing the fruit list, he pays a well merited compliment to Messrs. Gray, Son and Adams for the manual of fruits they have published, founded on the Horticultural Society's Catalogue, giving the synonymes of each subject. Mr. Glenny

has not given the synonymes, but he has cautioned people to buy none that are not in the list, as many have six or eight names, and they will be buying the same things. The only exceptions would be known novelties, but the list appears to us to comprise every fruit at all desirable in first-rate establishments, while all secondary things are left out; the advice therefore is useful, and should be followed. In the lists of plants there is the same improvement. He has not interfered with the arrangement, but has struck out many worthless and weedy subjects, and inserted many good ones. He has evidently thrown all considerations but quality out of the question. The fact of a thing being as common as the grass in the field, has not excluded a really good plant from the list. We only wish he had cut up the old one more than he has; he has been too merciful if any thing, but without cramming in every thing new he has added every thing good, though it must be confessed he disputes with many about the quality of things novel, and the lists feel this. Gardeners may look in vain for things they have known to be recently introduced, but which the Editor does not consider worth a place. There is plenty of room for the exercise of this kind of judgment in a catalogue which can only contain a small percentage of the plants introduced, and there may be some whose taste in such matters may differ. Certain, however, it is, that not one in a dozen of the plants introduced even since the last edition was printed, are worth cultivating, when the quality of those already popular is taken into consideration. We could almost wish the Editor had flung the whole of the catalogue of plants overboard, and given us a new one of his own arrangement as completely done as that of the fruit. The list of apples will show how completely he has answered the purposes of those who have no room for middling productions, and as he has observed in the introduction to this part of the work, those who order any thing that is not in the list annexed, will be almost sure to have one of the same under another name. The apple list is as follows:—

APPLES THE BEST IN CULTIVATION.—Alfreton, K. Aromatic Russett, D. Ashmead's Kernel, D. Baltimore, K. Barcelona Pearmain, D. Beachamwell, D. Beauty of Kent, K. Bedfordshire Foundling, K. Blenheim Orange, K.D. Borsdorffer, D. Boston Russett, D. Brabant Bellefleur, K.D. Braddick's Nonpareil, D. Claygate Pearmain, D. Cockle Pippin, D. Cornish Gilliflower, D. Court of Wick, D. Court Pendu, D. Devonshire Quarrenden, D. Downton Pippin, D. Dredge's Fame, K. Duchess of Oldenburg, D. Dumelow Seedling, K. Dutch Codlin, K.

Dutch Mignonne, K.D. Early Julien, D. Early Nonpareil, D. Emperor Alexander, K. Fearn's Pippin, K.D. Flower of Kent, K. Forman's Crew, D. Franklin's Golden Pippin, D. French Crab, K.D. Golden Harvey, D. Golden Pippin, D. Golden Reinette, D. Golden Russet, D. Gravenstien, K.D. Hawthornden, K. Herefordshire Pearmain, K.D. Hubbard's Pearmain, D. Hughes' Golden Pippin, D. Ingestrie Red, D. Juneating, D. Kentish Fillingbasket, K. Kerry Pippin, D. Keswick Codlin, K. King of Pippins, K.D. Lamb Abbey Pearmain, D. Leadington Grey, K.D. Lemon Pippin, K.D. London Pippin, K. Lord Nelson, K.D. Lucombe's Seedling, K. Maclean's Favourite, D. Manks Codlin, K. Margaret, D. Margil, D. Mère de Manage, K. Newtown Pippin, K.D. Nonpareil, D. Nonsuch, K.D. Norfolk Beaufin, K. Northern Greening, K. Oslin, D. Pearson's Plate, D. Pennington's Seedling, D. Pile's Russet, D. Pine Apple Russet, D. Pitmaston Nonpareil, D. Powell's Russet, D. Red Astrachan, D. Reinette Blanche d'Espagne, K.D. Reinette du Canada, K.D. Rhode Island Greening, K.D. Ribstone Pippin, D. Ross Nonpareil, D. Royal Russet, K. Sam Young, D. Scarlet Nonpareil, D. Scarlet Pearmain, D. Sops of Wine, D. Sturmer Pippin, K.D.

If to this we give the list of pears, a good idea may be formed of the value of the selections made for the work. The plant lists are just as complete in their way. Of course they do not and cannot contain collections of florists' flowers, for not only would they occupy more room than is consistent with the plan, but they would to the extent of nine-tenths be useless and thrown away before the edition was sold out.

THE BEST PEARS.*—Althorpe Crasanne, Aston Town, Autumn Bergamot, Autumn Colmar, Belle et Bonne, Bergamotte de Hollande,* Beurré Bosc,* Beurré d'Amalis, Beurré d'Arenberg,* Beurré de Capiaumont, Beurré Diel,* Beurré Ranz,* Bezi Vaet, Bishop's Thumb, Bon Chrétien Fondant, Broom Park, Brown Beurré, Calebasse, Calebasse Grosse, Chaumontelle, Citron des Carmes, Colmar,* Conte de Lamy, Crasanne,* Delices d'Hardenpont, Doyenne Gris, Doyenne White, Duchesse d'Angoulême, Dunmore, Easter Bergamot,* Easter Beurré, Emerald, Eyewood, Flemish Beauty, Fondante d'Automne, Forelle, Gansel's Bergamot,* Gendeshheim, Glout Morceau,* Green Chisel, Groom's Princess Royal, Hacon's Incomparable, Jargonelle, Jean de Witte, Jersey Gratioli, Louis Bonne de Jersey,* March Bergamot, Marie Louise, Monarch, Napoleon,* Ne plus Meuris,

* Those marked * will do for walls, and are worth growing on them.

Passe Colmar,* St. Germain, Seckel, Shobden Court, Summer Bergamot, Summer Bon Chrétien,* Summer Frank Real, Swan's Egg, Thompson's, Urbaniste, Van Mons Leon Le Clerc,* Vicar of Winkfield (wall only), Williams' Bon Chrétien, Windsor, Winter Bon Chrétien, Winter Crasanne, Winter Nelis.

KITCHEN PEARS.—Uvedale's St. Germain, Bezi d'Heri, Black Worcester, and Catillac.

In this way has the present editor rendered the volume, like his Almanack, a complete guide to the purchaser of fruits; but we think Mr. Glenny has unwittingly done Messrs. Grey, Son and Adams an injustice, in saying their Catalogue was founded on that of the Horticultural Society. Among the original articles is one on Guano, another on acclimating plants, a third on the construction of fountains, that are well worth careful reading and great attention. The editor has disarmed criticism by the acknowledgment of his very humble pretensions. He says:—

"In preparing the twenty-fifth edition of this popular work, I have done little more than remove a few redundancies and add a few notes. The former will not be missed, and the latter will speak for themselves.

"Eight years having elapsed since the last edition was published, the valuable catalogue of fruits, flowers, vegetables and plants became very deficient; novelties and favourite subjects have increased more in that period than they had in three times the number of any former years, and many of those which were in high repute in 1839 have been entirely superseded by the superior productions of the present day. In the catalogue, therefore, will be found the greatest alteration, for in that I have endeavoured to comprise every thing worth cultivating in a good establishment, while many even of modern introduction are discarded for lack of those merits which alone justify the recommendation of any new subject.

Mr. Glenny should have added lists of the best florists' flowers, and plants, with a summary of the properties that constitute perfection, as they are now universally adopted by judges and exhibitors. The lists would be found exceedingly useful to those who wish to buy nothing but the best, and the remarks on the properties of flowers and plants would have enabled the amateur to select the best from any number of subjects in bloom.

We must, however, admit that he has done all he professed, and something more. Taking the book as a whole, it is without exception the most useful, and should unquestionably be purchased, read and studied by every man who has a garden, and that before a man has wasted his time upon the trashy publications

of later date; for he would then be able to distinguish between the original and the elaborated and garbled plagiarisms that swarm in the numerous trumpery periodicals and garden newspapers, that literally speaking live upon older and better writings.

GARDENING MEMORANDA FOR APRIL.*

THE whole tide of garden labour has now set in; activity and vigilance are especially necessary, for although all planting is complete, and alterations, removals, and new work done, there are many things to do arising out of such matters. Newly-planted trees must be examined, to see that they are well secured, and undisturbed by wind and weather. It may be that those in very dry situations require watering; stakes may require fresh tying; the ground around a tree treading close again from being disturbed; cuttings from all kinds of plants, to bed out, should be taken off, and put to strike in a little bottom heat. Carnations and picotees should be put into the blooming pots, or planted out where they are to flower. Pinks and pansies may be put into beds out of their small pots, without disturbing the balls of earth, or they may be transferred to larger pots, according as they are wanted. Dahlias for amateur growers may be thrown together into a slight hot-bed, without potting, to start their eyes; and the roots be parted, so that there shall be a good eye to each portion of root. When so parted the portions of root may be cut to a moderate size, to go into a forty-eight-sized pot, and be placed in a greenhouse to grow until May. All greenhouse plants should be examined as to the state of their roots in the pots, and if full, changed to pots a size larger, with as little disturbance as possible to the roots. Watering becomes now an important consideration, for as plants grow fast or approach flowering, they absorb a good deal. Climbing plants should be carefully trained. The bulbs of gloxinias, gesneras, tropeolums, and such like, begin to show their growth. If they are in pots too small, change them the instant they begin to grow. In the stove we have many plants requiring a change of pot, and although less firing is required, it should be always kept pretty even in temperature, the night being somewhat lower than the day; and due attention must be paid to syringing the plants, pipes, and floors. The convolvulus is now in fine order. Hoveas, camellias, epacris, rhododendrons, azaleas, orange and lemon trees, and many other subjects planted out in the borders or centre bed, are in perfection. Give plenty of air; in fine weather you can

* A very elaborate and complete Calendar of Gardening Operations for April is published in No. 28 of the Horticultural Magazine.

hardly give too much. The tulip bed is rapidly advancing to flower, and the hyacinth beds are in bloom; the necessity of protecting them is evident; frost would contaminate the bloom of the hyacinth and spoil that of the tulip; covering, therefore, against frost, blighting winds, and heavy falls, is absolutely necessary. Those who fancy covering fruit trees while in bloom against the effects of frost, should now be on the alert: for our parts, we never care to do it; but if it must be done, let it be with transparent covering. There will now be plenty of occupation in cropping the kitchen garden; the orchard requires but little. The only fruits that want looking to are the vines and wall trees—to fasten any branches that are loosened. Auriculas are flowering this month, and roses require pruning; but of these things hereafter.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING APRIL.

The Greenhouse.—From forty-five to fifty-five degrees by day, and thirty-five to forty-five degrees by night, allowing five degrees more when sunny.

The Conservatory.—From fifty-five to sixty-five degrees by day, and from forty-five to fifty degrees at night.

The Plant-Stove.—From seventy to eighty degrees by day, and about 65 degrees by night.

The Orchid-House.—The warm or Indian house, from seventy to eighty-five degrees during the day, and from sixty-five to seventy degrees during the night; the Mexican house may be kept from five to ten degrees lower, both night and day.



EUGENIA MORITZIANA.

EUGENIA MORITZIANA, Karsten (Moritz's *Eugenia*).—Myrtaceæ § Myrtææ.

As growing in a state of nature, this plant forms a majestic tree, attaining from eighty to one hundred feet in height, with a trunk six feet in diameter. Such a tree would at first be thought altogether unsuitable for artificial cultivation in plant-houses; it has, however, been found to produce its blossoms freely on young plants of from two to three feet in height; and as it bears fine evergreen foliage, and pretty, myrtle-like blossoms, it will be by no means an undesirable addition to our gardens, which doubtless it will soon reach from those of Germany, to which it has

been introduced through the agency of Dr. Karsten, who found it during his travels in Venezuela; and has named it in compliment to his friend and fellow-traveller, M. Moritz.

Under cultivation, this species would form a large evergreen shrub, acquiring size with age. Most probably it would also adapt itself well to the tree form in which oranges and the allied plants are grown. The bark of the wood is of a light ash colour. The leaves are opposite, of an elliptic figure, rounded at both extremities, from three to four inches long, and from an inch and a half to two inches broad, of a leathery texture, with pellucid dots, bright green on the upper side, and on

the under side coloured with an ochrey powder. The flowers grow in axillary cymes, and are very abundant; they are about the size and of the appearance of those of the common myrtle, with four obovate, obscurely ciliated white petals, enclosing a large number of white thread-shaped filaments bearing the anthers, these threads being inserted in several rows just within the base of the petals. The flowers are very fragrant, and the leaves and fruit have a fine cinnamon perfume.

It is a native of the Colombian Andes, growing at an elevation of 5000 to 7000 feet. The natives call the tree *Guayabo negro*, on account of the blackish colour of the wood, which property is very highly esteemed. It flowers in December, in its wild state.

Young plants of this species may no doubt be trained into the form of handsome ever-green bushes, if kept well stopped back when young. They will require a rich loamy soil; and as much of their beauty will be dependent on their having a good breadth of healthy dark green foliage, they should be grown on freely, by giving them a liberal share of pot-room. This is a point which in itself will be likely to check excess, inasmuch as large pots become inconvenient. To secure dark green foliage, for the purpose of contrast with the white blossoms, some of the saline manures should be used sparingly, in the form of a weak solution. The plant will not be likely to thrive in a temperature much below that kept up in a plant stove, where, however, it may occupy some of the coolest positions. In summer it may be kept in the greenhouse. On the whole it is very easily cultivated. It may be propagated by cuttings, planted in sand, under bell glasses, and placed where they may feel the benefit of a slight degree of bottom heat.

SHALLOW AND DEEP PLANTING, AND THEIR EFFECTS ON FRUIT-TREES AND ORNAMENTAL PLANTS.

VERY few persons, even among professional gardeners, pay proper attention to the depth at which trees should be planted, consequently, more than half the number planted are placed in great danger. The numerous failures which were observed in the largest metropolitan plantations of late years, may be safely attributed to a want of care, or, perhaps, the want of knowledge, in the operators. The most extensive jobs round the metropolis were the various cemeteries, and it is to these we allude. If amateur gardeners make blunders of this kind, it may be forgiven, but, for the most part, these plantations were undertaken by nursery-men, and performed by their own men, and

ignorance, or incapacity, or idleness, was very apparent among one-half the operators. When it is possible to do too much, or too little, the gardener ought to know which error is the least fatal; but we may assign the motive for deep planting in preference to shallow, to a notion of saving trouble. If plants, however, are properly placed in the ground, those of tall growth require support against the wind, which has great power over them. To remedy this, and save the trouble, they put them down low enough to tread them fast; and then, while they save the trouble of supports, incur the risk of failure, and the certainty of damage. But contractors for plantations should be able (or employ some person who is able, if they are not,) to make stipulations for the proper conducting of the work, and to see that those stipulations are fulfilled. Among the conditions imposed on the planter should be that of supporting, by some means, all shrubs and trees above a certain height, and also that of planting nothing lower in the ground than will bring the collar of the root level with the general surface. Exceptions may be made to some plants which would strike root at every joint, such as laurels, which they might be allowed to plant as they pleased, and all those shrubs which will accommodate themselves to their stations; but, in a general way, it is to be recollected, that when the root is too deep, and the plant, or tree, is not of a nature to strike out roots at the proper distance from the surface, it cannot flourish. It may live, so that the contractor who guarantees their safety for a year may just get his money, but the plant merely exists, never grows well, and at last dies, too late for the owners to get redress. On the other hand, if a plant be merely held upright on the surface, and have its roots spread round it, and a few inches of soil put over them, the roots have power to go down, and will go down quite as far as it is necessary they should to support the tree or shrub. If, therefore, we err at all, it should be in favour of shallow planting, because the plant can help itself, and not in behalf of deep planting, because the plant is then helpless. The roots of plants want air and warmth as well as the parts above ground, and if the subject be sustained properly by the good management of the planting, it will soon accommodate itself to the place it is to stand in. If the surface-soil be naturally dry, the roots will run down after moisture, and if it be wet, they will spread near the top; but in no case can a tree, or plant, except those of the nature we have mentioned, flourish if the collar be lower, that is, materially lower, than the surface. In the plantations we have examined in the early days of their planting,

the Portugal laurels and firs that failed were, without exception, planted too deep. The same may be said of cypresses, yews, and some others; we observed, in some cases, that there were six inches of soil above the collar, or upper portions of root. It is quite true that the firs must have been supported by stakes, if they had not been planted deep, because the wind had a good deal of power, even the power to disturb many, notwithstanding the deep planting, and hard treading. In planting very small subjects over which the wind has no power, there is no excuse for deep planting, not even the notion of saving trouble; but here the blundering is quite as general, and, though not so fatal, far from safe. It is the slap-dash mode of hurrying, that induces the carelessness in small planting, as much as the ignorance of the importance of properly attending to the depth; holes are dug in a hurry, too deep, as often as the right depth, and the planter goes round with his assistant, or, perhaps, without one, holds the plant in the hole, pushes the loose soil in upon the roots, treads it in hap-hazard, just as it happens, and so leaves it to its chance. He tries to get the number in, and the work done, as quickly as possible; some are right and some wrong; and, although strong young plants will bear a good deal of ill usage, too many are permanently injured, or never recover at all. Having, therefore, pointed out the ill effects of deep planting in public works, which must have been observed by every body who saw the cemeteries in the first year or two of their existence after planting, we can hardly caution too urgently all planters to be a little more careful than usual in conducting this operation. Hundreds of persons who complain that their trees and shrubs fail, that their fruit trees do not bear, that things somehow will not do well with them, may attribute all the mischief to this simple but very general fault; we therefore entreat those who have a regard for the subjects they are planting, to attend to two or three safe rules. First, on no account plant anything deeper in the earth than it has been before; let the collar of the root be level with the general surface, or above it, for if the roots do not like to be so shallow, they will of themselves go down lower. If the root be spreading, loosen the earth, spread the roots round the stem, throw from round about the place enough soil to sustain them, and heap it up round the stem so as to just be even with the collar, which is in all well-grown nursery plants the mark which shows the depth it stood before; put strong stakes, (if it be a tree, or the plant be tall,) sloping towards the stem, which should be so fastened as that the wind cannot move

it, because the roots will have no power to hold it until they have struck fast into the ground. Be just as particular with small plants, which, if planted at exactly a right depth, instead of having to struggle against disadvantages until the roots accommodate themselves to the ground, will lose no time, but set off into healthy growth at once. If any of the doubtful will take the trouble to plant two young fir-trees, one six or eight inches below the collar, and the other exactly the depth of the collar, they will convince themselves in one season of the necessity of attending to these few hints. But, however we may be disposed to forgive ourselves for anything we have done in our ignorance, we can hardly overlook the carelessness which carried such blunders into public works, nor the errors committed by people who have been sent us from the nurseries themselves. Although we have mentioned deep planting as the cause of many thousand failures of trees, shrubs, &c., in public cemeteries, we will not go so far as to attribute all the failures to the same cause. There are many occasioned by gross carelessness of another kind; taking up the plants badly; chopping off the extremities of the roots; allowing them to dry between taking up and planting; neglecting to tread the earth close, and pressing it in between all the roots; allowing the wind to swing them backwards and forwards, till every fibre is disturbed, and many other causes, may have operated; but of all the failures we know, (and there were many in every one of the cemeteries,) deep planting was the prevailing error, and it is one against which we think it as necessary to caution the nurserymen and their labourers, and gardeners, as amateurs. The one ought to know better, and if he does, it was culpable negligence not to see things done properly as well as quickly; the other may not have considered the consequences, may not have had his attention called to it, and therefore may be well excused; and be it remembered, while we are alluding chiefly to shrubs and trees of the ornamental kind, because the public planting afforded examples, we cannot too strongly inculcate the necessity of attending to it in fruit-trees; for, with the exception of the vine, and some few that strike root at every joint, it is as important to keep the collar well up to the surface, and the roots spread, as it is to plant them at all. Many fruit trees live, but never flourish; they exist, but make no healthy, wholesome growth. Let everybody who has such, examine the root; it is quite certain there is something wrong. Prune the roots, cut in the head, replant it shallow in good soil, and there is every reason to hope for a cure.



METTERNICHIA PRINCEPS.

METTERNICHIA PRINCEPS, *Mikan* (princely *Metternichia*).—Solanaceæ § Rectembryæ-Metternichieæ.

This fine plant is the only kind known of its genus. It will be seen, that in general characters it has some resemblance to the shrubby *Daturas* and *Solandras*, which form such conspicuous and noble ornaments of our greenhouses and conservatories at certain seasons of the year; the above engraving, however, gives but a very inadequate idea of its real merit. The genus was instituted by

Dr. Mikan, and is dedicated to the Prince Metternich, of European fame, who has been a liberal patron of the many scientific expeditions that have added to our knowledge of the natural history of Brazil, to which country this species is indigenous. A very good illustration and a description of the plant were originally published by Dr. Mikan; and, recently, it has been made one of the subjects of a series of *Illustrations of South American Plants*, published in this country by J. Miers, Esq., the text of which has also appeared in Hooker's *London Journal of Botany*. From Mr. Miers' beautiful drawing our illustration was prepared.

Metternichia princeps forms a handsome evergreen small tree, or large shrub, which is perfectly smooth in every part. It is noted as being remarkable for the bright green of its leaves, and the size of its pure white blossoms. The habit of the plant is branching, furnished with copious foliage. The leaves are elliptical and entire, thin, and somewhat membranous in texture, and with slightly revolute margins; they are from three to four inches long, and from an inch and a quarter to an inch and a half in width; both surfaces, when viewed under a strong lens, are seen to be minutely dotted. The

flowers are produced at the end of the branches, terminally, a little lateral shoot pushing past, and bearing a few others in a sub-racemose manner. The calyx is large, and divided into four, five, or six leaf-like segments, generally half an inch, sometimes an inch in length; the corolla is funnel-shaped, two inches and a half long, an inch broad at the mouth, and two inches across the border, the tube in the upper part being somewhat bell-shaped, marked with many longitudinal veins, and towards the base more contracted; the border, or limb, is divided into five obtuse lobes, which are waved and crenulated on the margin; the colour is white. The flowers are succeeded by two-valved capsules, the divisions of which are deeply two-lobed, so that the opened capsule is apparently formed of four lance-shaped segments; it contains several linear winged seeds.

The plant is a native of the country about Rio de Janeiro; and has not, as far as we are aware, been yet introduced to this country, although it would form a very desirable addition to the many noble exotics of which our gardens can boast.

The attention of those who have commercial or other connexions with Brazil, and especially with Rio, might be well directed to the introduction of this fine species. We have no certain indication of its natural flowering season.

In the absence of any direct information

concerning its cultivation, we can only suggest a few particulars, which may be worth practising when it comes to be introduced:—It will require a stove temperature; at least, it will require such in the earlier part of the season, or during the time it is making its growth; then probably it will unfold its blossoms in a greenhouse or conservatory, and if so, they will continue longer in perfection, than in the more confined atmosphere of a stove. That universal compost for vigorous growing plants—turfy peat and loam, with sand—would no doubt be found highly suitable to the development of this, which may be expected to grow with considerable freedom, to attain to considerable size as a pot plant, and to require in consequence a corresponding degree of encouragement for its roots. While growing, it will require a free share of water; and after flowering, when at rest, should be kept moderately dry. Propagation, as respects the production of large plants speedily, would no doubt be best effected by planting cuttings of such shoots as do not indicate a disposition to bloom; but if for extensive increase, no doubt each of the buds of the stem if planted shallow, having the leaf and a portion of stem attached, would produce a plant, if placed in a hot-bed frame or propagating house where they would be supplied with a mild moist heat.

NEW FLOWERS AND PLANTS.

RHODODENDRON BROOKEANUM, *Low* (Rajah Brooke's Rhododendron.—*Ericaceæ* § *Rhododendrea*).—A beautiful evergreen shrub, either epiphytal or growing upon moss-covered rocks. The roots are large and fleshy, and the branches are furnished with large, smooth, nearly stalkless, oblong-lanceolate leaves, and loose terminal umbels of flowers; the latter are from two to three inches across the limb, and vary much in colour, from yellow to red; one variety has rich golden flowers, and in another they are rich coppery red; the blossoms are between funnel-shaped and bell-shaped, with five blunt revolute lobes nearly as long as the tube. Native of Borneo, growing on high trees in damp forests, or on moss-covered limestone rocks. Introduced in 1847. Flowers (in Borneo) from November to July. *Culture*.—Requires a damp, warm stove, and but little rest: probably does not require to be cultivated as an epiphyte; soil, of loose decayed vegetable materials; propagated by inarching, grafting, or budding.

RHODODENDRON GRACILE, *Low* (slender Rhododendron).—*Ericaceæ* § *Rhododendrea*.—A beautiful, slender growing evergreen shrub, with lance-shaped drooping leaves, from six to seven inches long, indistinctly marked on

the lower surface with dark freckles. The flowers grow in a terminal umbel; they are funnel-shaped, nearly three inches long, and about two across the limb, which is composed of five blunt, flat, imbricating lobes; the colour is rich fiery red, with a pale violet-coloured throat; the anthers are deep brown. Native of Borneo, on sandstone moss-covered rocks at the Sirul mouth of the Sarawak river; very local. Introduced in —? Flowers (in Borneo) all the year round. *Culture*.—Requires a damp warm stove, and scarcely any resting; soil of loose decayed vegetable materials; propagated by inarching, grafting, or budding.

RHODODENDRON VERTICILLATUM, *Low* (whorled-leaved Rhododendron.—*Ericaceæ* § *Rhododendrea*).—A fine epiphytal evergreen shrub with long fleshy roots; the young branches are slightly downy. The leaves are large, oblong obtuse, stalked, and heart-shaped at the base, convex and revolute at the edge, downy on the stalk and midrib, and thickly studded on the lower surface with minute ferruginous points; they are arranged in irregular whorls. The flowers grow in large heads, and are between two and three inches long, and nearly two inches across the limb; they are bell-shaped, with an erect limb of

five roundish lobes, of a reddish crimson colour, without spots. Native of Borneo, growing on trees, at an elevation of 4,700 feet. Introduced in —? Flowers in October. *Culture*.—Requires a damp, warm stove; soil of loose decayed vegetable material; propagated by inarching, grafting, or budding.

RHODODENDRON LONGIFLORUM, *Lindley* (long flowered Rhododendron).—Ericaceæ § Rhododendrea.—A beautiful little evergreen shrub, growing about eight feet high, with smooth, shining, obovate leaves, revolute at the edge, and arranged in whorls. The flowers have a long curved tube, and an erect, short, five-lobed limb, which becomes reflexed; they grow in close heads of nine or ten together, and are fully two inches long, and of an intense crimson colour. It blooms when quite young, but does not grow very freely until it has attained considerable size; when in bloom, it is exceedingly beautiful. Native of Borneo, growing on high trees, in low damp jungles in the vicinity of Sarawak. Introduced in —? Flowers in —? *Culture*.—Requires a damp, warm stove; soil of loose decayed vegetable material; propagated by inarching, budding, or grafting.

GESNERA BREVIFLORA, *Lindley* (short-flowered Gesnera).—Gesneraceæ § Gesneræ.—A pretty half-shrubby perennial species, with unbranched stems, a foot high, covered with long spreading hairs. The leaves are opposite, oval, six or seven inches long, dark green above, and somewhat hoary beneath. The flowers are tubular, three quarters of an inch long, bright rich red, and very shaggy; they appear in fours in the axils of the upper leaves. Native of Mexico. Introduced in 1847. Flowers in September, or may be had in bloom nearly all the year if started in succession. *Culture*.—Requires a stove; sandy peat, and leaf mould; propagated freely by its scaly roots.

CUSCUTA CALIFORNICA, *Choisy* (Californian Dodder).—Cuscutaceæ.—A curious and free blooming little parasite, resembling the dodders of our own country. It is leafless, and consists of slender, twining, thread-like stems, which here and there produce rather plentifully, small compact heads of flowers, which, as they grow older, separate, and form short loose racemes; the flowers are white, funnel-shaped, with five recurved segments. Native of California, in fields, near Sonoma. Introduced in 1847. Flowers in the latter part of summer. *Culture*.—Requires a frame; the seeds should be sown along with those of some soft stemmed annual in pots, and when strong enough, and before it destroys the annual plant which it first grew upon, some soft wooded shrub, such as a Pelargonium, should be brought within its reach; it will soon ad-

here, and grow freely upon it. Propagated by seeds.

CUPHEA SILENOIDES, *Nees* (Catchfly Cuphea).—Lythraceæ § Lythrea.—A pretty annual plant, growing about a foot high, having a much branched habit, and being clothed in nearly every part with viscid glandular hairs. The leaves are opposite, entire, and obtusely lanceolate. The flowers grow singly from the axils of the upper leaves, thus forming a leafy raceme; the calyx-tube is red, cylindrical, furrowed, with a short spreading limb; the corolla consists of six stalked petals, which are rounded and spreading, the four lower ones smaller, deep blood-purple colour; the two upper ones much larger, and pale at the margin. Native of Mexico. Introduced about 1844. Flowers through great part of the summer. *Culture*.—Half-hardy; best raised in a hot-bed; common garden soil; propagated by seeds.

CAMELLIA JAPONICA, *var Storyi* (Mr. Story's Camellia).—Ternströmiaceæ.—A very fine variety. It is of vigorous habit, with healthy-looking foliage, of a broad ovate figure, ending in an acuminate point. The flowers are rather above medium size, after the style of those of imbricata, very double, and well formed, the petals being of good outline, and firm texture; the colour is a deep rosy pink. A garden hybrid. Raised about 1846, by W. H. Story, Esq., of Whitehill, Newton Bushel, Devon. Flowers in the spring. *Culture*.—Requires a cool greenhouse; good loam, with peat; propagated by inarching on the free growing kinds.

GOLDFUSSIA ISOPHYLLA, *Nees* (equal-leaved Goldfussia).—Acanthaceæ § Echmatocanthi-Ruellidæ.—A handsome, low, bushy shrub, growing two or three feet high, with four-angled branches, slightly swollen at the joints, opposite, glabrous, narrow-lanceolate acuminate leaves, which are deep green and marked with six principal oblique veins, besides the midvein. The flowers grow about three together, on short axillary peduncles, and are very copiously produced, rendering the plant very ornamental; they are funnel-shaped, with a bent tube contracted below, and terminating above in a nearly equal limb of five rounded lobes; they are of thin texture, with many ribs or folds, and are blue somewhat variegated with white. Native of the East Indies. Introduced before 1847. Flowers in the winter months. *Culture*.—Requires a stove; turfy peat soil, with a little loam and sand; propagated by cuttings, planted in sand, and placed in a hot-bed.

SMEATHMANIA PUBESCENS, *Brown* (downy Smeathmannia).—Passifloraceæ.—A tall shrub, with terete branches, the younger portions of which, the principal veins of the leaves

beneath, and the outer sepals, are all covered with rusty silky hairs. The leaves are large, oblong, leathery, and glossy, alternately situated, and sinuately toothed on the margin. The flowers are large and white, growing singly from the axils, and consist of ten pieces or sepals, the outer of which are green, gradually becoming petaloid, the inner ones being entirely white; these segments are oblong, and acute, spreading widely when the flowers are fully expanded. Native of Sierra-Leone. Introduced in 1846 by Mr. Whitfield to the garden of the Earl of Derby. Flowers in February. *Culture*.—Requires a stove; loam, peat, and sand; propagated by half-ripened cuttings planted in sand, under a glass, in heat.

SERICOGRAPHIS GHIESBREGTIANA, *Nees* (Ghiesbregt's Sericographis).—*Acanthaceæ* § *Echmatanthi* - *Gendarusseæ*.—A showy, much branched shrubby plant, smooth in every part, with four-angled dark red branches, swollen at the joints, and bearing distant elliptic acuminate undulated leaves, which are deep green above, and paler beneath. The branched flower stems are produced from the axils of the leaves and the end of shoots, bearing about ten flowers on each stem; the flowers are ringent, and of a bright red colour, with a scarlet style. Native of Mexico. Introduced to this country from the Belgian gardens in 1847. Flowers in the winter months. It is also called *Justicia Ghiesbregtiana* (Lemaire) and *Aphelandra Ghiesbregtiana* of gardens. *Culture*.—Requires a stove; peat and loam, with sand; propagated by cuttings, in sand, placed in a gentle heat.

ACACIA IXIOPHYLLA, *Bentham* (ixia-leaved Acacia).—*Fabaceæ* § *Mimoseæ-Acaciæ*.—A beautiful dwarf branching shrub, of a graceful, spreading habit, the branches of which are smooth, or nearly so, and are clothed with narrow, oblong-lanceolate, obtuse phyllodia, from the axils of which proceed the globular heads of rich deep yellow blossoms, in pairs from each axil, along a considerable portion of the branches, so that the plants become exceedingly ornamental. Native of New South Wales, on the Liverpool plains. Introduced in 1846. Flowers in March. *Culture*.—Requires a greenhouse; loam and peat soil; propagated by seeds, or by cuttings planted in sand.

ACACIA VISCIDULA, *Bentham* (clammy Acacia).—*Fabaceæ* § *Mimoseæ-Acaciæ*.—A pretty dwarf clammy shrub, growing three or four feet, or perhaps more, in height; of an upright habit, not much branched, bearing narrow linear phyllodia recurved at the point, and in pairs, from their axils, the globular heads of yellow blossoms, which are rather numerous produced. It has something the appearance of *A. ixiophylla*, but the latter is

preferable on account of its more diffuse and graceful habit. Native of New South Wales. Introduced in 1846. Flowers in March. *Culture*.—Requires a greenhouse; loam and peat soil; propagated by seeds, or by cuttings planted in sand.

STROBILANTHES LACTATUS, *Hooker* (milky-leaved Strobilanthes).—*Acanthaceæ* § *Echmatanthi-Ruellidæ*.—This is a very pretty and desirable plant, whether in bloom or not. It forms a branching sub-shrubby plant, growing about a foot high, the branches being numerous, herbaceous, and obtusely four-angled. The leaves are ovate-acuminate, smooth, and dark green above, prettily variegated with a broad irregular milky line down the centre, purplish beneath. The flowers are funnel-shaped, much contracted below, and above expanded into five obtuse minutely toothed lobes; they are of a pretty pale purplish white, and are produced either from the axils of the leaves, or the terminations of the shoots. The plant is altogether a very pretty one. Native (probably) of the East Indies. Introduced in 1846. Flowers in the winter months. It is the *Ruellia grandis* of gardens. *Culture*.—Requires a stove; free compost of peat, loam, and sand; propagated freely by cuttings planted in sand, and placed in a hot-bed.

OXYPETALUM SOLANOIDES, *Hooker and Arnott* (solanum-like Oxypetalum).—*Asclepiadaceæ* § *Asclepiadæ-veræ*.—A sub-climbing shrub, or under-shrub, of little beauty. It is everywhere clothed with a close villous tomentum. The branches are weak and slightly branched. The leaves are oblong-cordate, ending in a little point; they become gradually smaller towards the upper part of the plant. The flowers grow in stalked few-flowered corymbs, which form together long terminal leafy panicles; they are small, of a dull purplish red, the bell-shaped corolla being cut almost to the base into five oblong-lanceolate spreading lobes. Native of Rio de la Plata, and South Brazil. Introduced in 1846. Flowers in the summer months. It is the *Schizostemma longifolium* (Decaisne). *Culture*.—Requires a warm greenhouse; peat, loam, and sand; propagated by cuttings placed in heat.

PRUNELLA WEBBIANA, *Maund* (Webb's Self-heal).—*Lamiaceæ* § *Scutellareæ*.—A pretty dwarf herbaceous perennial, growing about a foot in height, with oblong leaves, slightly rounded or heart-shaped at the base, the stem terminating in an oblong head of purplish labiate flowers, which are of rather showy character. The native country is not certainly known. Introduced before 1844 by P. B. Webb, Esq. Flowers in summer. *Culture*.—Hardy; common loamy soil; propagated readily by parting the roots or by seeds.

ONCIDIUM PHYMATOCHILUM, *Lindley* (long-tailed Oncid).—Orchidaceæ § Vandee-Brassidæ.—This is a very pretty species, now not very rare. It is an epiphyte, with smooth oval pseudo-bulbs, and single oblong stiff leaves of a dark green colour, speckled beneath with red. The flowers are borne in a loose panicle, divided into branches, the stem reaching about two feet high; the sepals and petals are long, and very narrow, the flowers from tip to tip measuring three inches and a half; they are green, barred with brownish red: the lip is shorter, of a hastate figure, with the side lobes short and rounded, and having a cluster of tubercles at the base; the colour of the lip is white, except at the base, where it is clear yellow. Native of Brazil. Introduced in 1843. Flowers in April, and throughout the summer. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the plant.

ONCIDIUM LURIDUM, *var purpuratum* (purple-stained Oncid). Orchidaceæ § Vandee-Brassidæ.—This is a fine variety of one of the best formed of the numerous species of *Oncidium*. The habit and foliage resemble those of the *O. luridum*, but the flowers are far more handsome; the sepals and petals are richly speckled with purple, and the lip is a rich crimson. The native country is not certainly known. Introduced about 1846. Flowers in September. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the plant.

BEJARIA COARCTATA, *Humboldt and Bonpland* (close-headed Bejaria).—Ericaceæ § Rhododendrea.—A charming evergreen shrub, from four to five feet in height, having numerous pubescent branches, and alternate ovate-oblong, nearly sessile leaves, which when young are woolly on the under side, but when full grown become perfectly smooth and shining, rather convex above, and whitish on the under side. The flowers grow in terminal corymbs, and have woolly stalks; the calyx is smooth, of seven or eight blunt ovate sepals; the corolla consists of seven or eight smooth obovate lanceolate petals, which are closely arranged, and of a purple colour. Native of Peru, near Caxamarca. Introduced in 1847. Flowers in ————? *Culture*.—Requires a cool greenhouse; turfy peat soil; propagated readily by grafting on the *Azalea indica*.

EPACRIS WILLMOREANA, *Garden hybrid* (Mr. Willmore's Epacris).—Epacridaceæ § Epacrea.—This is one of the best of the many hybrid Epacris which have been raised in English gardens. It was produced by J. Willmore, Esq. of Birmingham; and was raised, we presume, between *E. grandiflora*, and *E. impressa*, between which it seems to be nearly intermediate, possessing much of the habit and

character of the former, and of the colour of the latter. It forms a spreading bushy shrub, bearing numerous flowers dependent from the under sides of the branches; they are long, tubular, and of a pale pink colour. An English hybrid. Raised about 1845. Flowers in the spring months. *Culture*.—Requires a greenhouse; turfy peat soil; propagated by cuttings planted in sand, and covered by bell-glasses.

BEJARIA CINNAMOMEA, *Lindley* (cinnamon Bejaria).—Ericaceæ § Rhododendrea.—A pretty (? evergreen) shrub, with downy and hairy branches, and furnished with leaves which are remarkable for being covered on the lower side by a bright brown wool, which circumstance has suggested its name. The flowers grow in a close terminal panicle, and have very woolly and hispid stalks and calyces; the blossoms are purple, and apparently smaller than those of *B. coarctata*. Native of Peru, on the Andes of Caxamarca, at the height of 8,000 feet. Introduced about 1847. Flowers ————? *Culture*.—Requires a cool greenhouse; turfy peat soil; propagated by grafting on the Indian *Azalea*.

FOOD FOR THE PEOPLE.

As there is no calculating upon how much or how little wheat, potatoes, and other articles of food we may be able to procure from abroad, it behoves every one who has a rod of ground that he can appropriate, to use it for some useful nutritious food. There is no substitute that can be compared with the potato for wholesomeness or for its property of satisfying, and nourishing us. That is to say, there is not a vegetable production in the known parts of the world that will give us as much food to the acre. We therefore most earnestly advise all our fellow-countrymen, rich as well as poor, to let one-fourth, at the least, of every vegetable garden be planted with potatoes. The newer sorts may be preferred only upon the general ground that even if the space has been potatoes before, a sort that has not been grown there will be more likely to succeed than a potato which has been cultivated on the spot; and this we repeat as one of the rules we have always laid down, not to grow the same crop twice on the same ground, and never, if you can help it, to grow your own seed. There are many comparatively new sorts which are not dear—that is, not beyond the price that ordinary people can buy at; and the difference of the crop in value will enable any body to buy for their own use, and sell for seed if the sort continues to hold up a good price. We also strongly recommend an extended growth of beans, peas, carrots, beet-root, parsnips, and such other vegetable pro-

ductions as will preserve longest and offer nutritious food, because it is the only way of securing us against the possible wants of a community deprived of ordinary resources. It is impossible to calculate upon the acres that will go uncultivated in disturbed countries; still further beyond our means of computation are the acres of growing produce that will be destroyed. It is not in the nature of things that a continental war will be avoided; and if it were possible to avert the collisions of countries and nations, nothing can prevent anarchy, and confusion, and a war of parties. It behoves us, therefore, to look to the worst; to provide all we can for ourselves, and to grow all the food that the country is capable of producing. Let those who have waste land, capable of cultivation, plough it up and grow something. The labour in the market is far too plentiful, and wants employment; and if it be a bad speculation, or a sacrifice, remember it is a sacrifice worthy of a patriot, to give, in the first place, wages to the labourer, and, in the next, to provide food for the country in case of an emergency. Had there been as many potatoes planted last year as there would have been but for the groundless and senseless alarm that was created, they would have been within the reach of hundreds who cannot procure enough wholesome food. All that we can do now is to reiterate and refer back to the opinions we have given, and the assertions we have made on the subject of the Potato Commission, and urge all classes to neglect no spot that is capable of producing that which is proper for the sustenance of man. It is yet good time to plant potatoes, though no time should be lost. It is not too late for many other highly nutritive vegetables—in particular French beans and peas should be sown, to harvest dry as well as to eat green. It is impossible to be too cautious or too assiduous, for in the event of a continental war, people will be unwilling to ship more than they can help, and everything would tend to raise the price of foreign produce. The worst that can happen to us is the reduction of our own prices, and the possible loss of our time and ground; and this, though a possible, is by no means a probable contingency. The potato will be in all cases nearly as profitable as wheat or other grain, while its capacity to satisfy, as an article of food, acre for acre, will no longer be disputed. All that can be urged against it is the impropriety of relying solely upon it; and the same argument could be used against depending altogether upon any single article. Had the Irish poor calculated upon wheat alone, barley alone, oats alone, or any other vegetable production, a failure would have been quite as fatal. The same caution against trusting to wheat, would

be quite as forcible as that against trusting to potatoes. The preference given to the potato by the people who had to live on it, was the strongest possible argument in its favour. It was the most easy to produce, and the most useful when it was produced. But any people but the Irish would have used the time they had upon their hands in some profitable employment. The great evil was, that as their food came almost without labour, they gave way to slothfulness—they cared for nothing beyond merely living. The absence of decent pride renders them careless of dress; and there cannot be found in all England or Scotland a people that would lie basking in the sun, day after day, without an effort, simply because their food for the season was provided. If our advice could reach these misguided men, we should beg of them to rely wholly on no one thing, but they ought not to neglect planting potatoes; they should cultivate other vegetables. But the national evil prevails against other crops because they require more labour. While upon the subject of Ireland we cannot help viewing its present state as one of the likely causes of deficiency there. The people are dragged from their occupations to further the designs of imprudent men, and all the energies that should be brought to profitable account in the cultivation of land, is wasted in unmeaning demonstrations of brute force against everything like order and peace. This very circumstance must lead to the neglect of their crops, and by consequence to shortness of provision, and forms another strong reason for providing all we can; for ill as they deserve the sympathy of the industrious classes, unworthy as they are of the regard of the wealthy, they have had one taste of the blessings of a paternal government in the sacrifice of eight millions of money to supply their wants, and they will not fail to clamour for a repetition of what proved the wages of indolence and ingratitude.

Since this article was commenced, and while it is actually printing, news has arrived that Russia, foreseeing the evils we have been anticipating, has forbidden the exportation of corn. The alarm occasioned by this step will lead to other countries following the example, and there are many who look for a suspension of the labours, and a destruction of the produce of agriculture in many parts of the continent. Joined to this, there is every prospect that the agricultural labourers in Ireland, who have seen that England furnishes food for the starving peasantry, are giving themselves up to turbulence and idleness, at the instigation of those who are leading them from the paths of honest industry to those of rebellion. A land, therefore, calculated to produce more than it can consume, is to lie fallow for want

of labourers to make it fruitful. This ought to enforce, with double and treble strength, the appeal we have made to those who have land to bring into cultivation, the means of applying the necessary labour.

HORTICULTURAL AND AGRICULTURAL SCHOOLS.

BY JAMES GRIGOR, OF NORWICH.

It is not the object of this paper to offend any one engaged in the praiseworthy occupation of teaching. Let us hope that not a school exists without inculcating some sound lesson. If the scholastic system be faulty it is because it is not suiting itself to the times—not extending its branches where there is room. It is not reconstruction that is asked for, though many inconsiderate persons would clamour for the remodelling of the whole course of study. Few, for example, would wish to see the Classics excluded from our Universities and Colleges; for, though the sum and substance of many of those writers be to perpetuate the airy dreams of mythology, it would indeed be a sorry sight to find all men becoming downright practical thinkers, the more especially in matters pertaining to nature. We envy not the man who has no ideas of the sun apart from his light and fervour; of the moon except as a lamp to light him home; or of winds apart from their urging on some mechanical contrivance.

The time, however, has arrived when realities must be looked to as an especial part of education, and it now becomes every man to ask himself the stern questions, "What am I doing towards the earth's fertility? Is the ground better for my being on it, or am I a mere cumberer? I am placed here by the Almighty, and over my lands come showers and sunshine, and those sweet and nourishing influences which give the increase: in what shape do I render back those talents at harvest-time—with great gain or loss?" In individual cases, perhaps a satisfactory answer might be had, but in the minds of men generally, the subject has not even been seriously thought of. In order to remedy this state of things, what so proper and necessary as the establishment of schools chiefly devoted to the facts connected with the growth and maturity of our garden and farm crops? To establish a school, is looked upon in some quarters as a very great undertaking, but in reality it is a matter simple enough. An old barn might be converted into a school-room for 15*l.*; and where the scholars are few, a spare room might be employed with less cost still.

The first and simplest kind of agricultural school is that in which boys from ten to fifteen years of age are taught reading, writing,

grammar, arithmetic, and book-keeping, in conjunction with the most improved methods of cultivating the soil. This is called the "Self-Supporting System," three hours each day being devoted to instruction in the school-room, for which the scholars give their labour for a like period in practically carrying out the great purposes of agriculture: this work consists in manuring, digging, sowing, cleaning, reaping, &c. Amongst the advantages of this plan are these:—1. The hours of recreation, as it may be called, are just as instructive as those which are employed in the school-room. 2. The health of the boys is preserved; for it too often happens that by over-confinement incurable maladies are originated, and the best prospects of parents blighted. 3. We shall suppose a boy done with his course of study; and instead of having to learn a particular trade, as is usually the case after leaving other schools, he is ready, the moment after quitting such an establishment, to fill any office whatever connected with the cultivation of the land.

But in order to get a complete view of what young men leaving such a school are capable of, let us look at the branches of education recommended to be adopted. Reading, writing and arithmetic are of course taught every where; but there are other points in which it becomes every young farmer to be an adept.

1. *Correspondence.*—A singular subject, many will think, but it is one in regard to which agriculturists are somewhat deficient. The beauty of correspondence is to express your wants in few words politely put together. Another beauty is to have some system in it, so that a man, when he writes to his friend, may expect an answer within a reasonable time. The best models of correspondence at the present day are to be found in some of our Joint Stock Banks; but as the public cannot be expected to have access to such places, let it suffice to say that not a jot or tittle is put off for a moment, but seized upon as a matter of course every day. It is beyond a question that agriculturists do not display that sharpness of intellect, and that readiness of address and reply, common to most other branches of commerce. The time has come, however, when the transactions of the farm must be quickened, and the interchange of agricultural commodities be made according to the fashion of the day.

2. *Farm Accounts.*—We are yet in the Dark Age as regards Agricultural book-keeping. The Royal Agricultural Society offered a premium lately for the best plan of keeping farm books, and the result was a collection of forms and devices disgraceful to our country. Of course no award was made. Now, what a

field is here open for schools ! Not a season passes without thousands of young men betaking themselves to the cultivation of the soil, without even keeping a book at all, and, consequently, unable at any given time to tell exactly whether they are progressing or retrograding.

3. *Interlining of Crops.*—Who can tell us the most perfect way of economizing the soil over a given space, by planting and withdrawing certain vegetables by a given time, &c.? No one. The subject is as yet untouched. It is true, it is a most puzzling study, because capable of such variation ; yet surely an approach to perfection may be made here as in other matters. Let one of the scholars, a young man of some intellect and enterprise, have this department assigned to him for an entire year. Let another succeed him in the same line, and it is hard indeed if something original is not suggested.

4. *Practical knowledge in reference to Crops in general.*—The other day, I asked an experienced farmer who resides at Hethersett, what his ideas were in regard to the growing of carrots. "The course to be pursued," he said, "is very clear : trench the land in November, leaving it rough in order that the weather may operate upon it, and then, during the middle of March, *apply rank fresh manure*, and sow in shallow drills ten inches apart." A celebrated allotment-holder living at East Carlton, states that all that is necessary is to *fork over* the land during winter, when *well rotted manure* should be added, and then, during the first week in April, drills should be made one foot apart, mixing the seeds in sand so as to separate them. Again, a current opinion is, that no manure whatever should be allowed for carrots, but that the land should be enriched sufficiently at the laying down of the previous crop. How easily might these difficulties be settled by an agricultural school, in which one of the scholars had to conduct experiments from one year's end to the other, solely in reference to the treatment of this vegetable !

5. *Agricultural hedge-fencing.*—The writer has elsewhere proved, that the land occupied unnecessarily with wide cumbrous fences and useless timber trees throughout England, far exceeds in extent the largest county in Britain. This is a startling truth, and the consideration of it ought immediately to lead to the adoption of a better system. What sort of education can exceed that which would give to England 1,280,000 acres of rich arable land from the hedge-sides alone, and a much larger space now unworthily occupied with misplaced timber trees ?

There are, no doubt, a few other subjects which should be prominently brought forward

in agricultural schools ; but the foregoing sufficiently indicate the nature of the points most deserving of attention. A mass of ignorance and prejudice must be overcome before an enlightened system can become general in England ; but it is just because there is this heathenism to be dispelled, that the establishment of schools is so earnestly urged. In the manufacturing districts, it is already openly avowed that the soil of this country is not in proper hands—the holders being deficient in energy and enterprise ; but the opinion of our fellow-men is a trifling consideration compared to the rendering which must be made to a higher Power. Whether men believe it or not, let it be repeated, that this question has to be asked of every one : "What have you done towards the improvement and fertility of My Earth ?" and it is just as true that unprofitable servants in the natural world will have disgrace for their portion, as it is that in the spiritual kingdom no idler shall be rewarded. This doctrine is nearly worn out in the present day ; and if a man be told of the responsibility he incurs in cropping the earth, he wonders whence the authority for such a view of things can come. It is legibly engraven, however. It may or may not be in the Sacred Scriptures : we leave such at present, and look to the prominent inscriptions written by the finger of God throughout the physical world. The inscription is addressed to man, and its reading runs thus :—"I have apportioned to you the Earth, and have appointed a seed-time : all may sow : dews, showers, and sunshine I cause to fall upon the ground. Though incessantly given, and what are called common benefits—the evil and the good sharing them alike—they are capable of yielding sustenance to the creatures which I have made, and to me a harvest of glory. See that *your duty* be well fulfilled."

In establishing a school, it is very necessary that it should bear the character of, and really be, a religious institution. Of all unpardonable things, that of Agriculturists forgetting the adoration due to the God of Nature appears to be the greatest. The writer has watched with peculiar gratification the good effects produced upon the young in rural districts by training their minds to think of the goodness of God as displayed in the works of Creation, and especially in the many points presented to them in the routine of their daily labours. It is in accordance with this view, that the prayers about to be used in the Agricultural School of Norwich have all a tendency to lift up the mind through the course and appearances of Nature, an idea well worthy of notice in other schools of a similar character.



ALLAMANDA SCHOTTII.

Allamanda Schottii, Pohl (Schott's *Allamanda*).—Apocynaceæ § Willughbeia.

There is much uncertainty in the nomenclature of the species of *Allamanda* which exist in our gardens, owing to the application, by different authors, of the same name to diverse plants. Under Linnæus's name of *Allamanda cathartica*, authors appear to have included two plants, which have been subsequently, by some, separated under the names of *A. Aubletii*, and *A. Linnæi*; and these two supposed diverse species have been again amalgamated by others under the original name of *A. cathartica*. Two—probably three—plants, distinct in their habits and characteristics, certainly existed in our gardens previous to the appearance of the more novel kind whose name stands at the head of this notice; and we shall endeavour, in the sequel, to supply the means of distinguishing these, and of identifying them with the names which properly attach to them.

We turn, for the present, to notice more particularly *A. Schottii*. This new species is one of great beauty, and will find a place in all choice collections of stove exotics. It is just one of those plants which are capable of producing a grand effect, its blossoms being large, bright coloured, and numerous, and its habit altogether favourable for their display. Doubtless, as an exhibition plant, it will be found to have, individually, few rivals; and when placed in company with such plants as the brilliant scarlet-flowered *Clerodendrons*, the rich pink *Dipladenias*, the new glowing

Æschynantha, and the delicate *Stephanotis* and *Schubertia*, it will not be unworthily associated. A very beautiful representation of it, given in the *Botanical Magazine*, furnishes the materials from which our engraving was prepared.

The plant is of erect suffrutescent habit—not scandent, as in the common species—and is glabrous or smooth in every part, except on the younger portions of the shoots, and on the petioles, which are furnished with fine short hairs; the stem, as it acquires age, becomes verrucose, or covered over with wart-like excrescences. The leaves are lance-shaped, ending in a narrow point, and tapering at the base into a short petiole; they are rather large, and grow in whorls of three or four; at the base of the leaves are small, acute, stipular glands. The apex of each shoot forms a large irregular panicle or cyme of blossoms; the latter are very large, often four inches long, and as much in diameter across the face of the expanded segments of the limb. In form the flowers are funnel-shaped, the lower half consisting of a narrow contracted tube, the continuation of which becomes suddenly expanded into a bell-shaped faux or throat, and this

again into a spreading limb of five roundish lobes, which are somewhat obliquely unidentate, or one-toothed. In this species the calyx segments are ovate-lanceolate, and almost leafy.

It is a Brazilian plant, first described by Pohl, a botanical traveller in Brazil. It was raised—from seeds sent in 1846 to Miss Barton by Mr. Graham—in the garden of R. W. Barton, Esq., of Springwood, Manchester, by the gardener, Mr. Stanton; and is now in the possession of Messrs. Lucombe, Pince, and Co., of Exeter. It appears to have been also raised, probably about the same period, in the garden of Mr. Spooner, of Southampton; the plants, in both cases, having produced their blossoms in the summer of 1847. One very desirable property of the plant consists in its habit of flowering when of small size, which it does when "little more than two feet in height, and in eight-inch pots." Sir W. J. Hooker mentions a slight discrepancy between the plant as raised at Springwood and Pohl's description, consisting of the slightly increased length of the contracted tubular portion of the flower; but this difference, if it really has a permanent existence, is very trifling.

The general treatment of the *Allamandas* may be thus stated:—They grow with vigour in a compost of three parts rough turfy peat and one-third turfy loam, with a liberal admixture of small lumps of charcoal, broken potsherds, and sand; the pots must be well drained. When the plants get well established, they should have pretty liberal shifts, using the soil coarse in proportion to the size of the pots. But where very coarse soil is used, it must be placed carefully into the pots, so that no hollow parts are left; it should, in fact, be packed closely, but not too solidly, together. From about November till the beginning of March the plants should be at rest, during which period they should be kept comparatively dry and cool, but free from the agency of damps. Early in March they may be started afresh, and at this season should have a thorough revision as to the state of their roots, either shifting them into larger pots if they are healthy and are required to progress, or repotting them into the same or smaller pots if they are sickly, or have already attained the ultimate size which is required; in this latter case both root and branch should be cut in, and the plant, as it were, grown over afresh. Old plants should, in fact, always be cut in before they are started. They should have a brisk heat and moist atmosphere while making their growth; say, if they have been wintered in a mean temperature of fifty degrees, give them sixty degrees at first, and after they are in a growing state, gradually increase it to seventy-five or eighty degrees by

day, and about sixty-five degrees at night. Always keep the night temperature lower than that of the day, and give as much of the artificial heat as possible through the early part of the day. Of course, as much air as can be safely admitted must be allowed them, the criterion being not to lower the temperature too much, nor to allow draughts or currents of cold raw air, or keen dry winds, to reach the plants. A mild bottom heat—say eighty degrees—to the roots is also beneficial when they are growing freely. They require to be regularly and fairly supplied with water; and when in full growth are benefited by occasional applications—say once in four waterings—of weak clear manure water. The branches must be more or less trained according to their habit, but should not be too rigidly restricted, especially while young; although, on the other hand, they must not be allowed to run together confusedly, which involves trouble and risk in their subsequent adjustment; this must be avoided. As the summer draws on, and when the plants are well advanced, they may be allowed to perfect their growth and produce their blossoms in the greenhouse or conservatory, but after they come into bloom they should be in a situation where they may be shaded from intense sun-light, with a view to prolong the duration of the blossoms. Propagation may be effected by planting cuttings of the half-grown shoots in sand, and placing them in a moist hot-bed, without covering them with bell glasses; they must, however, be shaded from strong sun rays.

We think the following allied species of *Allamanda* are, or have been, cultivated in English gardens:—

Allamanda Linnæi, Pohl (*A. cathartica*, Linnæus).—A sub-scandent species, with pilose branches, and leaves growing usually in whorls of four, sometimes opposite, of an obovate-obtuse figure, ending in an acutish point, the margins somewhat undulated, the upper surface glabrous, and the lower somewhat hairy. The flowers grow out laterally and not terminally, on the branches. It is said to be from the Antilles, and probably is found in Guiana also. This appears to be the plant represented in the *Botanical Magazine*, t. 338.

Allamanda Aubletii, Pohl (*A. cathartica*, Roemer and Schultes; *Orelia grandiflora*, Aublet).—Sub-scandent and smooth, the leaves growing either in whorls of about four together, or opposite, and of a broadly oblong acuminate figure, smooth on the upper surface, and slightly hairy on the nerves beneath. The flowers in this, also, are borne laterally. It is found widely distributed in Guiana and the places adjacent. The figure in *Paxton's*

Magazine of Botany (vol. viii. p. 77) is apparently intended for this plant.

Allamanda Schottii, Pohl (*A. cathartica*, Schrader).—Dwarf and shrubby, but not scandent, the leaves lance-shaped acuminate, growing in whorls of three or four, the branches terminating in a large irregular cyme of blossoms. This is a Brazilian plant, and is beautifully figured in the *Botanical Magazine*, t. 4351.

Allamanda puberula, var *Gardneri*, De Candolle.—We believe we are correct in referring to this species the plant figured in *Paxton's Magazine of Botany* (vol. xii. p. 79) under the name of *A. grandiflora*. It certainly does not appear at all closely related to either of the two first mentioned, of which, as *A. cathartica*, it is regarded as a large-flowered variety. Some of the more obvious discrepancies are, that the plant under notice is dwarf and shrubby, but not scandent, and bears its flowers terminally, not laterally. The variety *Gardneri* of *A. puberula* may be thus described:—Not scandent, the young branches pilose, the leaves in whorls of three or opposite, oblong acute, attenuated at the base, nearly sessile, coriaceous, smooth above, and downy on the veins beneath, the margins revolute, the cymes few-flowered; in all which respects it accords with Paxton's *A. grandiflora*. The flowers are very large, and the plant somewhat delicate, requiring careful nursing while young. Mr. Gardner met with it in the province of Piahy, in Brazil; and as the *A. grandiflora* referred to is stated to have been raised from seeds sent by Mr. Gardner, in 1836, to Mr. Cunningham, nurseryman, of Edinburgh, the presumptive evidence on this point is in favour of the identity of the two. A critical comparison of the plant in a flowering state with the detailed descriptions published in botanical works, would at once determine the question we have thought this a fitting opportunity to raise.

There are thus, as we think, four species of these yellow-flowered Allamandas, either now existing in our gardens, or at some time cultivated therein, of which the two first named in the preceding summary are very nearly allied, and the two latter are, perhaps, the most beautiful. All of them are, however, individually, of a highly ornamental character when well managed, and fully merit careful cultivation.

GARDENING MEMORANDA FOR MAY.*

Now the garden appears to repay us for some of our toil; flowers of all hues bespangle

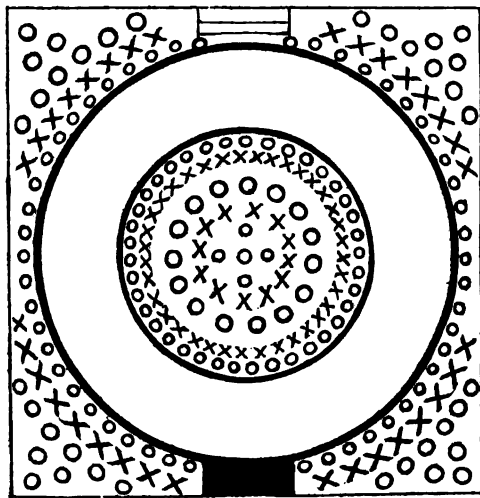
the beds and borders, and the pits and green-houses turn out their winter-stored subjects to deck the spaces left for them in the open air. Towards the end of the month the clumps are filled with verbenas, petunias, hydrangeas, geraniums, cinerarias, calceolarias, and the various other plants that lend their summer bloom to the outer garden. The annuals that have been sown under glass are planted out or potted, as they may require; those in the borders have come up and want thinning; the shrubs are growing, and many of them flowering in their several departments. Dahlias are removed from their pots to the places where they are to flower, and which should be indicated by stakes driven into the ground first. The tulip cloths should be up, that the sun, wind, and rain may be kept off without difficulty, while their bloom is in perfection. In the kitchen garden all is bustle: sowing crops; thinning or earthing up, as the case may require, those already up; planting out things to grow for eating, and others to grow for seed, forms a good share of the duty. Strawberries, which are such a general favourite, now require a good layer of straw or long dung between the rows, not only to prevent the evaporation of the water that is necessarily given them, but also to keep the heavy rains from washing up the grit on the fruit. In the shrubbery it is as well to examine choice shrubs, and remove or shorten all branches that are growing too vigorously, or in a wrong place, or in an awkward straggling manner. Pink and pansy beds require watching, watering, and weeding; seedlings want throwing away as soon as they prove themselves worthless, for they only spoil the seed of the good ones: this month it applies to pansies, next month to pinks. Now the seed of many valuable plants and flowers should be sown. In the stove the treatment does not widely differ from last month's; the syringing of the plants, pipes, and floor may be required oftener, and extra vigilance in searching for troublesome vermin may be necessary. The conservatory requires to be swept clean every morning, as the dropping of the blooms will constantly make a litter about the place; plants may be removed into it from the stove and the greenhouse, and others that have declined blooming may be turned out; weeding and watering become serious duties, and unless well managed, the work may be thoughtlessly doubled or trebled. The weeding should not only be done before any of them seed, which in growing weather is in an incredibly short time, but it ought to be done in dry weather, and the weeds drawn off with a rake as soon as they are cut up, otherwise the first shower of rain may re-plant one half of them, and the work will have to be

* A very elaborate and complete Calendar of Gardening Operations for May is published in No. 29 of the *Horticultural Magazine*.

done again. Many people who like two seasons of roses leave some till this month to prune; these will be found to have pushed their growth the whole length of their branches all but a few eyes nearest the bottom. These trees, if left, would be earliest in bloom, long before those which have been pruned, but by cutting the branches back to those two or three eyes that have not started, it throws them back pretty nearly a month; so that, independently of the different seasons at which different roses bloom, the summer-rose itself, that is, such as the moss and cabbage-rose, may be made to form three successive seasons: one, which would come first, those not pruned at all; secondly, those pruned in March or April, before they begin to grow; and thirdly, those not pruned until May, which will bloom full a month later than the first. Turn gravel walks, and repair the verges.

SUBURBAN GARDENS.

THE management of those thousands of small gardens that are and have been of late years apportioned to respectable cottages and villas around almost every town of consequence, is of more importance than ordinary people imagine; for where there is enough to embellish the house, and not enough to be worth a regular gardener, they should be, and may be, so managed as only to require a little



superintendence of the owner, and an occasional day for clearing up. The original planning of the garden does much towards settling the future work, for it may be so laid down and laid out as to render weeding the only operation required, or in a way to demand almost constant attention to keep it in even decent order—and this latter is the case with a vast majority. We consider that if the succession

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING MAY.

The Greenhouse.—From fifty-five to sixty degrees by day, and forty-five degrees at night.

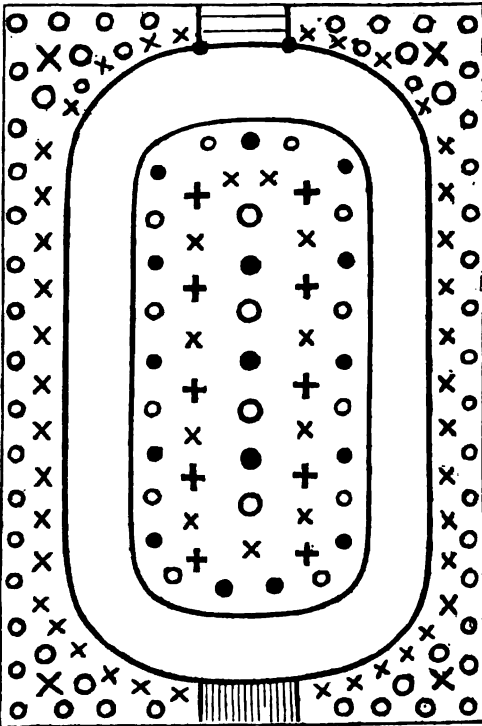
The Conservatory.—From sixty to seventy degrees by day, and about fifty degrees at night.

The Plant-Store.—From seventy-five to eighty degrees by day, and occasionally higher with sun heat; at night sixty or sixty-five degrees.

The Orchid-House.—The warm house from eighty to ninety degrees by day, or more by sun heat, and about seventy degrees by night; The cool, or Mexican house, may range about seventy-five degrees, or rather more with sun heat, and sixty-five degrees at night.

of flowers is to be kept up with potted plants, or by annuals and transplanted flowers, there will be found more occasion for labour in one of the small fore-courts of a cottage, or the front garden of a villa, than there would be in a garden ten times the size laid down on a better plan. The grand secret how to avoid trouble lies in the adoption of subjects that require no culture; and there is no lack of subjects as fine as any of the most troublesome and most costly. For instance, confine yourself to shrubs, bulbs, and perennials; and choose such as shall give the most flower in the least room. They should also be chosen with regard to keeping up a continuation of flower as long as possible; such, for instance, as will yield several colours in each month. The greatest abundance of colours and varieties will be, of course, in the usual months of April, May, June, July, August, and September; but much may be done for a choice of flowers before and after, and the principal object is not to have too great an abundance one month, and scarcity the others. To avoid this, the subjects and about their seasons of blooming should be chosen before any plan of planting is determined on, by first putting to each month about the same number of large and small subjects, and equalise the flowering as much as possible, and then whatever may be deficient in the number of varieties must be made good by the number of each. In choosing these subjects, look well to diversity of colour, because quantity of bloom without a variety of colour will not be effective. The principal thing to attend to in the display of these things is so to disperse those in flower at one time, that there shall be something like a whole design at all times, because no ground

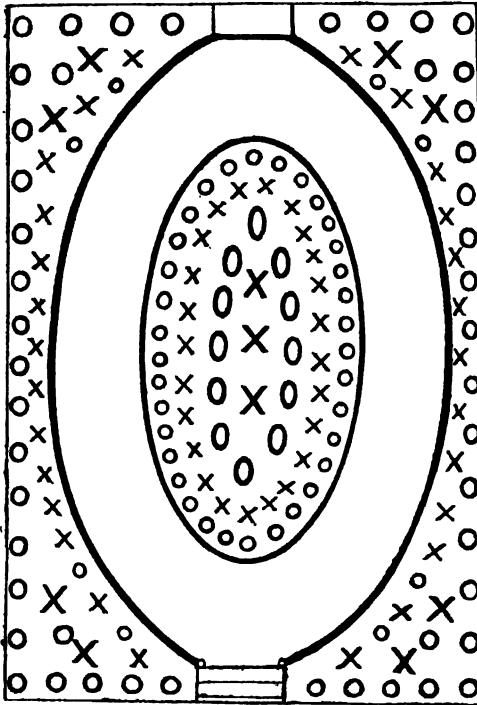
looks well when the flowers are all on one spot and the rest naked; and where there are but one or two things in flower,—for instance, in some of the winter months, suppose there is nothing but the Christmas rose and the laurustinus,—there should be two or more, unless the laurustinus happen to have a permanent central situation, in which case, one or three, because if there be more than one, there should be two more, to make a kind of balance; and we mention the laurustinus because it flowers for months, and that in the most dreary period of the year. So also the Christmas rose may be seen when there is scarcely anything else, and therefore three or four patches equally distributed, or at least



uniformly distributed about the plot of ground. There are many gay flowers that in the course of one year's observation we may see and note down for our adoption, but we are principally indebted for the first effects to a few great favourites. From the accompanying lists there may be selected a few subjects that will enable us to make a show pretty nearly the year round; and to make the appearance moderately equal, we ought to be more lavish of those subjects which come when all others are scarce. For instance, there is a great scarcity of flowers from November to February, therefore of the few we have got we must plant rather liberally. In mild winters we have many of the autumnal flowers length-

ening their beauties, and there will be occasionally a frost that cuts off everything. However, we must make the best of this. Gardens are not expected to be quite so gay in winter as in summer. Suppose in one of those front gardens, that are so numerous round every town and city, in front of pretty cottage and villa residences, there is only one circular bed, with a good path round it, and the rest of the space is border; or, if the garden be longer than square, let the bed be oval. Commence operations for a permanent plantation by selecting first the shrubs and plants according to their heights and quantities, viz. for the front twelve inches of the border, say, Christmas-rose, violet (two colours), snow-drop, daffodil, anemone (three colours), polyanthus, primrose (two colours), hyacinth (three colours), early tulip (three colours), crocus (three colours). *Amaryllis lutea* may also take their places. If these were placed in rotation round the centre bed, and also round the side borders, six inches from the edging, there would be a great profusion of flowers at one time, and a scarcity at others; therefore, to avoid this sort of discrepancy as much as possible, put more of those which come at a scarce time of year than you do of those which flower when there is profusion. Presuming a centre bed to be fifteen feet diameter, the border would be forty-five feet round, consequently would hold forty-five subjects, a foot apart. We have mentioned eleven subjects, to say nothing of their various colours, which increases them considerably; you may exercise some taste in the disposal of these subjects, and so arrange them that whatever shall be in flower may be somewhat dispersed about the garden. Commence in the very centre, opposite the entrance, with the Christmas-rose, and plant the same on each side of it, violets for instance; and so proceed with hyacinths (three in a patch, red, blue, and white), polyanthus, blue crocus, early tulip, primrose (the purple), *Amaryllis lutea*, snow-drop, red hyacinth, colchicum, yellow crocus, Christmas-rose; this will bring you one-fourth round the bed; do exactly the same on the other side, which makes half; and start again from the Christmas-roses on the sides to complete the circle; and there will be a vacancy, but finish each side with a Christmas-rose, and the vacancy may be filled up with the three colours of hyacinths and crocuses; or if, by being a little liberal with distances, you find yourself close to the opposite centre, take care to have one Christmas-rose in the centre, if you cannot get one at the end of each completion, and fill up with anything else. It should be remembered that in forming this plantation moderately small plants will do; and where bulbs are used, three hyacinths, as

close as they can be put, six crocuses and three daffodils, six snowdrops, and so on, will be enough, because they will wonderfully increase every year, and in four or five years will be close to each other. All these subjects should be planted six inches from the edge of the bed. Presuming this to be so far completed, we now go a foot back, and there we have the polyanthus, narcissus, late tulip, *Lupinus polyphyllus*, blue and white, the columbine, English iris, dwarf martagon lily, phlox, crown imperial, and a few other subjects, which are somewhat taller than all those in the front row. Start in the same way, from the centre opposite the entrance. Plant full



twelve inches further back, and eighteen inches apart. The principal thing to consider in planting this row is to place those that bloom at a different period behind and near such as are not in flower at the time—the pæony behind the Christmas-rose; the narcissus behind the snowdrop, the columbine behind the hyacinths, the *Lupinus polyphyllus* behind the crocus, and so on throughout; avoiding putting any that bloom at the same time near one another. In the planting of this row the same care is to be taken to plant in the same order left as right, so that a kind of uniformity is preserved. Still further back, and not less than one foot or eighteen inches, may be furnished with the taller plants. The *Delphinium grandiflorum* behind the pæony, right and left the scarlet lychnis, next on each side

to these the white lily, then the taller phloxes, then the orange lily, the tall *Michaelmas-daisy*, and the *chrysanthemum*; and thus complete a third circle. The centre of a clump of this description may be some favourite evergreen shrub; but as we have only occupied by these three rows of planting about four feet of border all round, and have left enough room for a few taller subjects, about half-a-dozen hollyhocks may be planted further in with advantage; and this clump or bed, when once planted, requires no sowing or planting for three or four years. The bed becomes a mass of flowering plants; as the various flowers decay, the remains of the plants have to be kept tidy and clean, and the ground between them occasionally stirred and weeded. It may be objected that we have directed everything to be planted too closely. We have no objection to more room, but in limited places every body is anxious to be supplied with some flower at all times, and there is a natural wish for all that can be grown. There is no other disadvantage in this close planting than the apparent crowd; but the subjects in flower will never be too plentiful, and when their flowers have decayed the plants are cut down in some cases, trimmed in others; but year after year the plants come up without care or trouble, and die down in their season. The only thing to attend to is, to keep it clean. The borders will be of unequal breadth; the path ought not to be less than six feet all round the bed, and the rest border, which of course will be deeper at the corners, and not the same width in any two parts. In the broader parts of this border the shrubs may form the background; at the back of the broadest portions there is an opportunity of planting a flowering tree, or even more than one; and where there are shrubs to be planted, there may be a variety adapted to the place. In the four extreme corners there may be two almond or double-flowered peach, and two double-flowered cherry, the one with a rich pink bloom, the other pure white; or two white-thorns (double-flowered) and two scarlet; in front of these there may be a rhododendron, on either side a *laurus*; still further right and left, a *Pyrus japonica*; in the foreground, a *Kalmia latifolia*; and still further right and left in the foreground, a plant of *Andromeda floribunda*; or, as this would take eight plants, and the *andromeda* is not a cheap plant, the *andromeda* at one extreme, and a red *Mezereum* at the other; in the narrower portions, a plant or two of the *Berberis Aquifolium*; and in the foreground, at proper distances from the house and from each other, rose bushes and standard roses. The extreme front may be furnished with the dwarf plants, bulbs, &c.

that are used in the front of the circle. In particularly shaded parts the violet, primrose (of both sorts), polyanthus, daffodils, crocus, &c. may be used to fill up; the only care required being that of so placing them as not to be in the way of each other. The shrubs planted may be diversified with the *Magnolia conspicua* (white), and *purpurea* (purple), the azaleas of the four colours, bright yellow, dark orange, scarlet and light tricolor; so also may the rhododendrons be increased in number because of their diversity of colours. The various hardy heaths may be used, white, purple and red; and the standard trees may be changed, the Gueldres rose being a pretty object. The mountain ash, too, may be added; but there is every opportunity in all this first planting to exercise taste, and we have given a sufficient outline of the plan to enable any one to plant, upon a large or small scale. We have only mentioned some of our most favourite subjects, but there are hundreds that are of the same nature, and which once planted are right for some years without further trouble, and simply require parting once in three or four years, for they would in that time almost, if not quite, meet, and form a complete mass, destroying even the weeds that would come up between them. We are not advocating thick planting as good gardening; but, on the contrary, if we wanted the work to last a longer time, we would substitute eighteen inches distance for twelve, and two feet for eighteen inches, for it is consuming a less number of subjects, and having more vacant ground to keep clear of weeds and in good order. As the patches of plants or bulbs become too large for the place, we should chop the herbaceous plants smaller with a spade, and dig up the bulbs and replant the smaller number again on the spot—but this need be done but seldom. In a garden thus once planted, the management is easy, and may be undertaken by the greatest novice; because he has only to keep it clean, cut down decayed flower-stalks, stir the surface of the earth, and pull up weeds. We have not mentioned all the subjects that may be used, but we subjoin a short description of the principal plants we recommend, and the exercise of a little taste will enable the veriest tyro to make his choice. Such a garden will be always showing some of nature's beauties; and nothing but one of those killing frosty winters which have been known to destroy even bays, laurels, and laurustinus, and sweep off kitchen-garden crops to the ground—and these are not by any means frequent—will interrupt the flowers, of which some will assert their right every month in the year. Let the following popular description of the subjects mentioned be read attentively, and the foregoing hints be acted

upon, more or less, and the suburban resident may in truth, like every other man, be "his own gardener."

A FEW SUBJECTS FOR SUBURBAN GARDENS.

ALMOND.—Blooming very early in the spring; a bright pink. There is a double flowered variety. The common tree makes a handsome standard, but there is a dwarf kind that blooms very small, and forms a good shrub for the clumps and borders.

PEACH.—The double-flowered variety is extremely rich and beautiful; but we need hardly say, they are the same genus as the almond, and extremely showy, as standards. As there is very little difference beyond the names, it matters little which is planted, but it would be of no use to have both.

HONEYSUCKLE.—The numerous varieties of this very sweet family are universal favourites. The common woodbine is as finely scented as any; but the one commonly known as the Dutch honeysuckle has larger flowers, wider and richer petals, and the bloom is so abundant as to literally cover the shrub, whether trained as a climber or constantly pruned as a shrub. It is one of the prettiest subjects that can be trained over a summer-house or a doorway, or on a wall; and blooms in the spring, although there are varieties that flower in several different months.

LABURNUM.—One of the gayest of blooming trees, with long racemes of golden-yellow flowers, forming one of the finest objects imaginable, with its profusion of drooping blooms. There is a purple, or, as it is improperly called, a scarlet variety, supposed to be a sport from the same kind, as a purple raceme may often be found on the yellow variety, and a yellow raceme upon the purple variety; while there may occasionally be found a raceme of flowers with both colours. The purple kind is not bright enough to be a fine object, and is only tolerable in large plantations.

WISTARIA SINENSIS, originally known as **GLYCINE SINENSIS**, is one of the most beautiful objects that can be imagined for the front of a house or a wall, or still more beautiful if trained to form a covered walk. It only requires a wire arch upon which it may be trained, and the branches grow so long and so rapidly that it soon fills the whole space. The flowers are fully as abundant as those of the laburnum; but the colour is a bright lilac purple, and the racemes often a foot long, which drooping, or rather hanging, so close together as to appear almost artificial; when the plant has laid hold of the soil that agrees with it, and which should be a rich loam, it will occasionally shoot twenty or thirty feet in a season.

THE THORN.—The common "may" of the

hedges is one of the thorns, but there are many varieties much esteemed. The principal, however, are the double-flowered white and the scarlet. This subject is handsome as a standard tree or a bush; but the former is the most appropriate, and shows it off to the best advantage. Some of this family are remarkable for their fruit, others for their leaves; but for limited gardens, the white and scarlet, commonly so called, are the only ones worth cultivating. They bloom very profusely in the spring, and last a considerable time in flower.

DOUBLE-FLOWERED CHERRY.—One of the richest of the white-flowered trees; the blooms are as double as a ranunculus, and completely cover the branches. It is also a handsome-growing tree, exceedingly graceful. Its chief fault is the shortness of the period of flower, for it soon falls; blooming in the spring.

GUELDRS ROSE.—A shrub or a tree according to its training; the flowers, though small, are in round bunches, forming complete white balls all over the branches. It is, therefore, among the most showy of blooming trees, and forms a very pretty object in a mixed plantation.

MOUNTAIN ASH.—Rather a coarse grower, and of lanky habit; bearing flat bunches of white flowers, succeeded by equally flat bunches of bright scarlet berries, which are the chief ornament, for they remain on the trees for months; and the leaves are handsome. The worst fault of this tree is its upright growth; this renders it an unseemly object alone, but a useful and showy subject in large mixed plantations; nevertheless, it may be used for the sake of variety, or rather contrast.

HOLLY.—The immense variety of foliage in this evergreen family renders it of the first importance in a shrubbery; but in a small garden, where flower is of the most consequence, it is only adapted for a specimen, in a conspicuous place, because it is the best evergreen that can be used when a tall and prominent object is required. Whether green or variegated, and whether with red or yellow berries, it is a pretty object all the year round.

MAGNOLIA GRANDIFLORA.—This is a very grand and very beautiful tree or shrub, or wall plant, as its training may be made to produce; it is very fairly called an aristocratic plant. The leaves are large and bright, and evergreen, like the laurel on a larger scale. The plant grows rapidly, and must attain a considerable height before it will bloom well. The flowers are as large as a swan's egg before they expand, and when fully blown are the size of a good plate; the fragrance beautiful; it blooms towards the latter end of the

summer, and it may be fairly esteemed as one of the most noble evergreens in cultivation. It flourishes best against a wall, because it is half inclined to be tender, or half hardy.

MAGNOLIA CONSPICUA.—A deciduous species of the family, blooming very early in the spring, with a white bloom, forming first like an egg, and abundantly covering every portion of the plant, at a distance of not more than three or four inches from each other, flowering very young, but, nevertheless, growing a noble shrub or tree of great size, according as its training is made to encourage the one or the other. It is a remarkable looking subject from the time its bloom buds throw off their dull coloured sheaths, and continues improving in appearance from the time the white egg-like bloom is free to swell; not a leaf is on the tree until that has been completed as to beauty, but the foliage shows itself soon when the flower-bud has attained its full size and begins to expand, yet the leaves make no progress until the flower is fully expanded and is decaying. It is a very pretty object from the time it is three feet high, at which size they bloom freely.

MAGNOLIA PURPUREA.—This is very like the last in all but the colour.

PRUNUS JAPONICA.—Another of those plants remarkable for blooming before the foliage comes out, and one of the most useful of flowering deciduous shrubs. It is exceedingly hardy, and can be trained to any form, from a close hedge through which nothing can penetrate, to a standard tree of any reasonable height, like a rose, or a wall plant, covering every inch of surface; in all of which forms the scarlet or the white (for there are both) flowers literally cover the stems. It is valuable as a dwarf shrub, because, when healthy, the flowers will be opening for months. If the early frosts destroy those that are actually expanded, and even those which are forward, others rapidly succeed them; so that the plant is beautiful for months, and will, when out of season, be continually throwing out bunches of flowers. It grows well in ordinary garden soil, and will flower before it is a foot high, from a cutting, looking well in any but a straggling neglected form. It naturally grows as close as a hedge, and bushes should be occasionally cut in wherever a branch is inclined to ramble. There is no shrub that can take its place or rival it, and they look remarkably well as standards (managed as standard roses should be managed). The stem four feet long, the head four feet through, forms one of the most beautiful objects imaginable, and a pair of these would be desirable in the smallest gardens; for even in winter time, if the season be mild, they will show their coral or pearl-like flowers occasionally,

although evergreens have the advantage of deciduous plants, in a general way, all through the dead season.

RHODODENDRON.—A very beautiful evergreen shrub or tree, according as it is trained, bearing fine cones of flowers at the ends of all the branches or shoots, and comprising every colour, from deep crimson, scarlet, and all the lighter shades of red, up to pale rose, and from deep purple up to pale lilac. The *Rhododendron Catawbiense* is the most handsome, and the colours are very various, from rich purple to almost a white. They are always beautiful. *Alta-clerense* is a bright crimson, and therefore a great favourite; but all the sorts, and all the colours, up to a pure white, are useful and fine. We consider, however, that the *ponticum* is the least worthy of attention or of garden room of the whole tribe, on account of the imperfection of its flowers as to form, and the general poverty of its foliage, and *Catawbiense*, in all respects, the best.

AZALEA.—A very hardy and brilliantly-flowering shrub, comprising many hundred varieties, the most distinct of which are *pontica major*, a bright yellow; *aurantia major*, brilliant orange; *coccinum major*, a dense scarlet; and *tricolor major*, a pale variety, in which there are white, yellow, and faint pink. Scores of others are as distinguished for their large flowers, and for some difference in their colours, but none are so well contrasted, nor so well adapted for general effect and brilliance, as the four we have mentioned. This family blooms before the leaves are formed, and may be picked out for the quantity of bloom buds they exhibit and the form of the plant, which should be bushy to the ground, and well covered with branches and bloom buds. They are originally from North America; and are, with many others from that locality, termed American plants. They grow best in peat, and when removed, should be taken up with as much earth to their roots as would flower them well if they were not even replanted. Some peat earth should be mixed with the soil, to the extent of one-half in quantity, for a few inches all round the spot it occupies, so that when the roots grow they should strike into soil congenial to their nature, for unless they grow freely they will not perfect their flower buds, and, were it not for their flowers alone, the *Azaleas* would not have the slightest claim to a place, for their foliage is mean and unimportant, if not actually shabby and untidy.

BERBERIS.—The common barberry is pretty in fruit and not ugly in flower. The blossoms are in yellow bunches, which are only less conspicuous than *yayer* shrubs because the foliage forms too much of an object for the bloom. For a short time it looks

pretty in flower, but its chief beauty is in its coral-looking fruit. It will grow anywhere; looks best as a bush feathered to the ground, but is hardly adapted to small gardens in that state. If intended for a small space of ground, for want of more showy subjects, it should be trained as a standard.

BERBERIS AQUIFOLIUM is a showy evergreen, and there are many varieties, and some distinct enough to be called species, which have bright and beautiful foliage, rich golden-coloured bloom, in compact bunches, and liberally produced over the whole plant, so superior, in fact, to the common barberry, that the latter has been banished from the gardens to make way for the evergreen sorts. The fruit of these are purple and round, like bunches of small grapes reversed. This is worthy of a place in the most choice and limited gardens and small shrubberies. It only requires to be checked a little by cutting back the branches that grow too exuberantly, and is manageable as a handsome shrub, with its foliage close to the ground, however large the plant may grow. It is a pretty object for its foliage alone, but the flower buds, flowers, and fruit add greatly to its beauty a large portion of the year. All the evergreen kinds, under their many different names, are good, and there is not much choice for ordinary observers, though those who get their living by trifling distinctions can see them when others would never see enough difference to call their attention.

ANDROMEDA FLORIBUNDA.—One of the most beautiful dwarf shrubs in cultivation, flowering abundantly, and interesting from the instant the racemes of buds first show themselves, until the flower is past and the seed-vessels decayed. It is rather slow in its growth, requires peat earth to do well in, blooms the very first year from cuttings or layers, and is one of the prettiest winter subjects during all the dreary months. The foliage, though evergreen, is not shiny, and the natural growth is handsomer than it can be made by any artificial training.

GARRYA ELLIPTICA.—This is an evergreen shrub, whose whole beauty consists in its catkins, which are long, drooping, and very graceful. The plant has hitherto been cultivated mostly in pots, and treated as a frame plant, but we have had it through several winters planted out without suffering anything, so far as we could observe, and therefore we consider it a hardy shrub, and worthy of a place, in every shrubbery; but the catkins, which are four or five times as long as those of the different kinds of nuts, are never other than a pale green, approaching a yellow. Their great length, and the graceful manner in which they bend in bunches from

the ends of the shoots, give the plant an elegant and imposing appearance.

THE ERICAS.—The hardy heaths are worthy of a place for their flowers, and because they will flourish in almost any poor soil; but a plant or two in small gardens will be sufficient, and only two or three of the varieties. These might be the purple, red, pale flesh colour, and white, if they were sufficiently favourites; but the only kinds we really feel inclined to value are the varieties of *Erica vulgaris*, of which there are purple, red, scarlet, and white. All bloom in April, in ordinary seasons, and before April, after mild winters.

CLEMATIS.—This is only adapted for climbing, to hide a defect in the covering of a summer-house or alcove, and is not valued for its beauty, but its perfume; but there are two or three kinds that are adapted for their beauty to cover a front of a house. *Clematis azurea grandiflora* has a large rich purple star-like flower, three inches across, and forms a beautiful object while in flower, though there is no perfume to recommend it. It is far more beautiful than the Passion Flower, on account of its conspicuous colour, and in training it, the branches should be laid as close to each other as will furnish the surface of the wall well. *Clematis Sieboldtii* has a white flower with a purple centre, not half so large as *grandiflora*, but very conspicuous and showy.

ROSES.—Of this family there are thousands of varieties, some of which are sufficiently distinct to claim the attention of ordinary people, others so similar as to be totally unworthy of any distinction. A still greater number are altogether worthless on every account. The Rose is, however, a general favourite; even the Dog Roses in the hedges are attractive; but there are a few kinds only that we should care for in a limited garden. The common Cabbage Rose and the common Moss Rose are universal favourites, but their period of bloom is short; they are, in fact, summer roses. The common China and the China Crimson, though poor and almost scentless, are valuable for their perpetual bloom. The Yellow Briars are remarkable, and are therefore cultivated as striking varieties, and the best of them, on many accounts, is *Harrisonii*. The White Provence is a fine one to sustain the character of a white rose, and there are many hundreds that afford a large choice for other peculiarities; but those who look at price as well as quality, may take the three old roses, Moss, Cabbage, and Provence, if they like no other; the old Chinas, for two more; Rose du Roi, or Lee's Crimson Perpetual, for its continued bloom and rich colour; *Harrisonii*, for a pretty yellow. All these are

cheap and good, dwarf or standard. Beyond these they need buy nothing, without seeing it in flower, and adopting it for its merit. Buy nothing beyond these we have mentioned on mere hearsay; rather lose a season; for of five hundred roses which are to be found named in many catalogues, it is extremely difficult to find a dozen equal to the Old Moss, Old Cabbage, Old Provence, Old Chinas, and Lee's Old Crimson Perpetual, named by the French people *Rose du Roi*.

LAURUSTINUS.—This beautiful shrub is one of the best ornaments in the shrubbery, and no garden that will hold a single shrub should be without it. How many months of the year this plant is without its flowers, in some stage or other (and in all stages they are beautiful), we hardly know, but think it almost doubtful whether the new flowers for the next season do not make their appearance before all the old ones have thoroughly decayed. At all events, it cheers the most dreary months of the year with its lively appearance; and whether the plant be six inches or six feet high, its bloom covers it as profusely as it is at all desirable to see it. No ordinary frost even damages the bloom; and when there are no flowers conspicuously seen, its dark green winter foliage forms a pretty contrast with the bright green shoots of the new growth.

KALMIA LATIFOLIA.—A very beautiful American shrub, a profuse bloomer, hardy, and evergreen, greatly esteemed among the American plants. It must be grown in peat-earth. The flowers are very curious, as well as beautiful, constructed almost like the inside of an umbrella, the stamens forming the wires which expand the top, and when the pollen is ripe they spring up from the corolla, and scatter the dust over the pistil. *Kalmia rubra* is a smaller plant, and has smaller leaves and flowers. *Kalmia glauca* is also much less than *latifolia*, which latter is much esteemed for its very pretty habit and the masses of flowers being better exposed, and more interesting when exposed.

EVERGREENS, GENERALLY.—Where there is a desire to produce effect with evergreens instead of flowers, regard should be had to the object in view in choosing the sorts of plants for use. Firs are useless, unless it is intended to allow them to grow into trees, for they soon become too large for gardens, unless it be those laid down upon a large scale, and they do not bear cutting. Hollies, yews, box, and laurels, on the contrary, bear the knife so well, that they may be allowed to grow until they are large enough to answer the purpose, and then be restrained by the knife, and even rendered handsomer for pruning. Cedars and arborvitae are also trees,

and may not be pruned; so that in all small gardens they must be avoided, unless you are prepared to sacrifice them when they get too large for their office. It is true, they are not rapidly growing subjects until after they have been established well, but they then soon acquire a large size.

We shall now describe briefly the habit of the plants and bulbs recommended, and a few others not mentioned, but which may be adopted with as much advantage as those we have named. Some of these plants are worth raising from seed, but as but few plants are wanted, it is far better to purchase at the nurseries the few required, instead of taking the trouble to raise them; and, indeed, as we set out upon the plan of so laying out gardens as to avoid all this trouble, and to render the possession of a garden a pleasure without the toil, we shall abandon all idea of taking any other trouble than once planting a place, to present only such objects as will come up year after year, and want nothing but cutting down again at proper seasons, or being allowed to die down of themselves. We have selected nothing but what can be purchased at moderate prices, and we have even mentioned where they can be had when there was any difficulty.

CHRISTMAS ROSE.—This is one of the heliobores, throwing up in the winter large showy white flowers, very conspicuous, without any leaves. These flowers last for months, and at length turn greenish and a dirty red. As soon, however, as they lose their whiteness they may be cut off. The foliage comes up after the flower has been out some time. The chief claim of this flower to the limited garden consists in its appearance when there are no companions. It may be had at any respectable nursery.

DAFFODIL.—One of the earliest of the bulbous flowers, contemporaneous with the snowdrop and violet, which frequently show their flowers between a succession of frosts which deter many others from appearing. The daffodil is a bright golden yellow, retains its beauty some time, and greatly assists the appearance of an early garden. All the varieties are good as early flowers, although in choice gardens they prefer trusting for yellow to the crocus, which is nearly as early as any other flower. To be had at all seed shops.

SNOWDROP.—This old favourite needs no description. The flowers are often seen to peep through the snow, so hardy is its nature, and hence perhaps its common name. The double is the more conspicuous flower of the two, and should be chosen in preference to the single on that account. All the leading seedsmen have the bulbs, both single and

double. There should not be more than six in a patch when planted.

CROCUS.—These are to be had of every seedsmen in the country, and are, perhaps, the most plentiful, but nevertheless the most brilliant, of all spring flowers. There are fifty varieties to be had by name, and they should be selected in bloom, if intended to be grown in collections, but the Cloth of Gold, the New Royal Purple, and the Broad Petalled White, are all we should care to grow for appearance. They are in flower before the snowdrop is out of bloom, and, for effect, should be placed distinct according to colour, yellow, blue, and white, not mixed. Three crocuses or six are enough for a patch, and they will soon spread over a large space.

EARLY TULIPS.—These are very distinct from the late ones in colour, habit, and season; but there are many varieties of early ones to choose from. Some are crimson with white; others scarlet with yellow; but the crimson and white are the only ones worth growing where the brilliant yellow of the crocus is near. The small Van Thols, which are the earliest of the tulips, are soon out of bloom, and are not worth much in a flower-border. They are sold by the hundred or dozen at all the seed shops, and are imported with hyacinths, &c.

LATE TULIPS.—Those intended for borders are generally the rejected of the florists, and so the most faulty in cultivation. The best way to get them is to apply to some florist for two or three sorts. *Min d'Or* is a rich golden yellow; *Charlotte's Cenotaph* is nearly all white; *Washington* nearly black and white; *Triumph Royal* is a bright crimson and white; and these are all cheap flowers, as well as good; so also is *Holmes's King*, delicate lilac and white; *Surpass Catalaque*, dark and yellow. They may be had of persons who can spare them, at about the price of the common mixtures of the shops; and there will be this difference, that every Tulip you possessed would be a good flower, though a cheap one. Even for borders, good ones should be chosen, because foul Tulips are offensive to everybody who knows anything about them.

CROWN IMPERIAL.—This is showy and graceful at a very early period of the spring, but it occupies some room, and is one of those subjects which may be easily dispensed with where room is scarce, because there are many bulbs in flower about the same time. It forms rather a noble object, for the foliage is fine, and the flower consists of a number of bells, hanging round the stem near the top, which forms a crown of green over the bunch of yellow or orange coloured bells. This flower has a scaly bulbous root, which is imported

by the London dealers, and sold in the autumn, with others that are annually received from Holland.

HYACINTH.—These noble flowers deserve more consideration, and, generally speaking, have more than any other subject. They abound in variety of form and colour, and, considering the millions that are cultivated, they are very high priced. It has been the practice of those who grow them in beds and borders to buy mixtures which are the same as named flowers in all but the name; but the objection to mixtures, although they are kept together, so far as colour goes, is, that we get early and late in the same patch, or the same row, and have therefore the effect altogether spoiled by a partial bloom. Whatever sorts be grown, the time of their flowering ought to be known, as well as their colours; and though all three colours may be flowered in one patch, they should only be such as bloom at the same time, and the earlier the sort the better, as flowers are most valuable when most scarce. The sorts best adapted for the border may be had generally at threepence or fourpence each, and, as one of each sort in a patch is sufficient to begin with, the seedsman should be told that they are wanted of the same height and the same season of blooming.

JONQUIL.—The sweet-scented jonquil is a very pretty, elegant, and graceful flower; there is but a narrow foliage, a pretty bunch of golden flowers, and an elegant form; they are neat in the border, and three of them in a patch would be quite sufficient at the commencement. They are far superior to the daffodil, not so large as the narcissus, but where the yellow polyanthus narcissus is to be grown, it must be remembered that the jonquil in effect upon the border is the same, though upon a smaller scale; the bulbs, like the rest, may be had at the seed shops.

NARCISSUS.—The only varieties we think worth growing are those kinds which have bunches of flowers instead of single ones, and are from this circumstance called polyanthus narcissus; but for the purposes we have pointed out, any of the following names will do. Grand Monarch, white with citron cups; Soleil d'or, yellow and orange; Czar de Muscovi, white and yellow; States General, sulphur and yellow; and New Yellow Primo, pure yellow; any of these will be fine. Their noble bunches of flowers continue a good while in perfection, if the weather is fine, and there is a pretty distinction; each sort should be by itself, for a mixture only involves uncertainty of flowering together, and so half the effect is lost. These are all to be had at the seed shops. Those sold in the bulb season at the marts in London and elsewhere, are the refuse after

the trade has had the picking; and the chances are, that although they appear the same as those in the shops, they are faulty in the bloom, which fails; and the paltry difference in the price between the cheap things at an auction, and the fair priced things at a shop, makes all the difference between disappointed hope and gratified ambition. There is nothing makes amends for the loss of a season, and a disappointment in the result of our handy-work in the garden. A friend who purchased many bags of bulbs at an auction mart, showed his bargain to a neighbour, who informed us of the bargains that had been bought. There were bulbs enough to fill his garden. The neighbour took our advice, and we bought for him, partly at Batt and Rutley's, and partly at Westmacott's, the same number of bulbs for about eight shillings more; the result was, that while one garden exhibited failure of bloom, and in many cases of the plant altogether, the other had hardly a fault among the lot.

IRIS.—There are several sorts of this beautiful bulb, Spanish and Persian, but the favourites are the seedlings raised in England of the largest kinds. These bulbs, like the rest, can be had at the seed shops, but those who are desirous of the best, should get them from the parties who grow collections; very few of the keepers of seed shops have troubled their heads about the English varieties, but have relied chiefly on imported bulbs. However, any of the sorts are pretty in the border, the Persian, Spanish, or English.

MARTAGON LILIES.—These are variously called, Turk's-cap lily among the rest of the names, but are dwarf plants with speckled leaves and scarlet flowers, of which the petals curl backwards, so as to show the inside of them, and conceal the outside; a brilliant scarlet colour, and many flowers, considering the size of the plant. They are among the most graceful of the lily tribe, so far as the proportion of flower to plant goes, and also as far as the proportion of height to width is concerned. These have a scaly bulb, and may be bought at the nurseries and seed shops, but they should not be long out of the ground.

The ORANGE LILY, or FOX'S LILY.—This is a tall gaunt-looking plant, but a first-rate subject for the back part of borders, because other plants conceal then the long ungainly stem. The bright orange colour of the blossoms makes a great show in their season, and they are a considerable time in bloom, for the petals are thick, and the weather has but little effect upon them. These require no culture but putting in the ground, when they will come up year after year for half a century, if the roots have but room to spread.

THE WHITE LILY.—This is as tall as the last, but the flower is better in form, a pure white, comes in a very graceful spike, and the plant has a much richer foliage, and therefore is a better formed plant than that of the orange lily. This is as hardy and as prolific as the other, and nothing can exceed its striking appearance in the season of bloom, for their silvery white, forming, as it does, a snowy mass, reflecting the light almost painfully to the eye when the sun is on them, may be seen an immense distance; when they are employed in small gardens it ought to be sparingly, as they almost kill all other subjects if there be more than a couple or four patches. The roots are scaly, like all the lily tribe, and may be had at almost every garden florist's and seedsman's.

AMARYLLIS LUTEA, very much like the daffodil, but blooms in the autumn, and therefore one of the most useful subjects where flowers are wanted the year round, and helps to render the border brilliant when the colchicum lends its aid.

COLCHICUM, a purple autumnal crocus, differing from others in nothing but the season of flowering, and for the change of season alone do we keep it in good flower borders.

All these bulbs may be planted just three inches below the surface, and that will be sufficient, no matter what their size; and the proper time to plant or remove bulbs of every sort is when the foliage has died down to the ground, and before they begin to indicate their new growth.

PRIMROSES.—Of these there are the common one, and three kinds of fancy flowers, that are justly great favourites. The dark crimson double flowers, the double purple or lilac, and the double white; they are very beautiful, but not half so robust as the common single one and its seedlings; they are all to be had at the nurseries.

POLYANTHUSES.—This is a favourite spring flower, but the common flowers that we see about in great profusion are not worth their place in a hedge-row. In all these common flowers there may be had bright and good varieties; wherever they are to be bought they are to be seen in bloom, and any one is blameable for not selecting the best. It may be that the first few plants that are procured for a suburban garden are bought unseen, but at the blooming time go to the nurseries and select good ones to take their place. The polyanthus is a dwarf healthy growing plant, with a profusion of bright flowers, of which the centre is yellow, and the border black, crimson, or red, as the case may be, and flowers in the winter or early spring months, always when the weather is very mild.

VIOLETS.—These are well-known dwarf

plants, of which there are many varieties, single and double, light blue, dark blue, and white, growing well at the foot of shady fences, walls, or round the roots of trees, or in shady borders; the only objection to the sun is that it so shortens the flowering period, and burns the plants up, otherwise they will grow and bloom anywhere, and may all be had of the nurseryman.

LUPINUS POLYPHYLLUS.—The handsomest of all the lupins, varying in colour from pure white to dark blue, through all the various shades that are intermediate. This is, perhaps, the very best of the lupin tribe, for the spikes of flower are longer than any other, and the blooms are closer to each other on the spike; the leaves of the plant smaller and more elegant, the plant more compact, the spikes in greater number, and the flowers being more permanent than those of other kinds, the entire length of the spike may be seen in bloom at one time, which is the finest of all properties. It is produced from seed, and if sown very early, and brought forward artificially, will flower weakly the first year, but there is no decided character and strength until the second; it comes up strong, or, perhaps does not die down after the flowering completely to the ground. It will spread rapidly, and unless parted would in time fill a large space, throwing many spikes of beautiful flowers every season.

PEONY.—This is a very fine herbaceous plant, dying down completely every year, and throwing up its shoots early in the spring, and exhibiting its monstrous double crimson blooms in great plenty soon afterwards; a couple or four plants are enough for any place of ordinary size. To be had at the nurseries.

SCARLET LYCHNIS.—The brilliant scarlet of this flower, generally rising two feet or more from the ground, is the principal thing that saves this plant for the gardens. The double-flowering scarlet is the best, but it is an untidy individual flower, and it is only in the mass that it is noble; the colour is very bright. It dies down every year; as soon as the flowers have done, the stems should be cut down, the dead leaves cleared off, and it may be left to itself.

PHLOX.—There is hardly any florist's flower that has so completely conquered all the radical defects as the phlox. There are varieties now with flowers as round as a shilling, trusses very fine, colour excellent, and some as dwarf as one foot, or even less; in the season the head of the plant is completely covered with blossoms. Phloxes, therefore, may be had from purple to pink, pale rose, and white, from one to three feet high. They die down like the lychnis, and come up again of themselves.

COLUMBINE.—There is a great diversity of

this plant; the colours are blue, dark and light, reddish and light; then there are parti-coloured varieties formed of one or more of these with white, and some of these striped varieties are splendid beyond all conception. However, these, like many other plants that are wanted in small quantities, are best selected when in bloom, and at the nurseries, where the plants may be marked by ourselves, and afterwards, if they be not in hands that we can depend on, taken up by ourselves. This dies down every year, and comes up in the spring or the later part of the winter.

DELPHINIUM GRANDIFLORUM.—One of the richest of all the branching larkspurs, and flowering with such an intense blue, as to be painful to look on long together. The plant is very tall and graceful, branching out a good deal on all sides, and can be seen at a considerable distance.

ASTERS, or MICHAELMAS DAISIES.—These are of various heights and colours, and form a mass of flowers for a considerable time, and that at a period of the year when flowers are scarce. They run chiefly upon light lilacs and purples: and, in selecting such things, we ought to look for the brightest and most showy; because in winter time, or even as it approaches, those objects which require close inspection to see their beauties are not half so good as others that can be seen at a distance.

CHRYSANTHEMUMS.—These are really useful garden plants; for when grown in moderate ground, and allowed to spread to a tolerable size, they will stand a good deal of frost. In selecting these, have recourse to those colours which are not furnished in Michaelmas daisies, and so avoid the lilacs and purples of the same shades: choose the whites, reds, and yellows, both dark and light, for they form a very good contrast by themselves, and make up well. They will grow well in the open ground, if allowed to go their own way, and as we profess here to take no trouble beyond that which is absolutely necessary, all we have to do is to place them far enough from the border or edge, so that part of their growth may be concealed by the more dwarf subjects.

HOLLYHOCK.—This is a noble subject, and only thrown a little into the shade by its more symmetrical rival, the dahlia, of which flower we have purposely said nothing, because we are going to do without raising from seed, or even planting, after the thing has been once done. The hollyhock gives us a variety of very distinct colours or shades, besides all the intermediate gradations,—black, blood red, bright crimson, pale pink, purple, lilac, primrose, yellow, white, and speckled; and whether there be one or a dozen, we have merely to take care that we select colours which contrast best with the great majority of colour at

that time predominant in the garden, although its towering figure of itself forms a contrast. The yellows, blacks, and reds are the best, because some of the roses are in bloom, and supply pink: none but the extremely double varieties should be chosen.

ANEMONE.—These are the most beautiful as a close object, or cut when they are double, but the single are the most hardy, and varied in colours; not only so, but they are large in bloom, and will often in the winter months afford a few stray flowers, which cheer the aspect of the garden. They are from tuberous roots, purchased at the seed shops or at nurseries; they spread like many other perennials; and although they propagate faster when taken up once a-year, they do very well for three or four years without. About three good blooming tubers in a patch are enough to plant at first.

HEPATICA.—These are beautiful spring flowers,—bright blue, red, and white, single and double. They throw up their flowers almost through the snow, if there be any, and seem to defy the ordinary frosts of spring. These flowers come up before their leaves, and they have the prettiest effect imaginable.

MONKSHOOD.—This is a poisonous plant, and the common purple one has no particular attractions, the Delphinium being a much better subject; but there is a variegated sort which is very gay indeed, and besides the flower being a prettier subject, the plant is more dwarf and far more handsome. It may be had at any of the nurseries.

ORIENTAL POPPY.—This is an extraordinary brilliant poppy, of immense size, and, except in very large gardens, hardly worth the room it takes. The flower is a vivid scarlet, as large as a good sized dinner-plate, but as flimsy and fragile as the common poppy of the field. From this cause, it is but a short time in bloom, and hence its want of popularity. It is as hardy, wants no kind of care, comes up of itself every year, flowers and dies again.

MANAGEMENT OF THE GARDEN.

During DECEMBER, JANUARY, and FEBRUARY, nothing more is required than keeping the beds and borders free from weeds, dead leaves, and litter of any kind. There is nothing that wants covering against frost—nothing that requires water in the dry weather. The plants that decay down after flowering, or that want to be cut down, have all been attended to in October and November; and there are many of the plants commencing their growth. There is the Christmas rose, and laurustinus, and most likely snowdrops, polyanthuses, primroses, and daffodils, (if the winter has been mild,) showing their flowers, and

the crocus, violet, and hepatics are coming forward; the hyacinths and tulips above ground: but it is hardly safe to meddle with the earth. The paths require to be kept clear of weeds.

MARCH.—Most of the plants are above ground, therefore, as there is no danger of injuring them, when you can see them well, you may, with a small fork, turn up the surface all over between the different subjects, and smooth it all over with a small rake, or by hand, merely breaking the lumps when there are any. Let this always be done on a fine day. The good effect of this on the plants will be striking in a day or two.—Many flowers in bloom.

APRIL.—Nothing required but the removal of weeds, if there be any. Early tulips and hyacinths rapidly advancing to succeed the crocuses and other early flowers, which have not yet disappeared. Almond trees in bloom last month and this.

MAY.—The garden very full of pretty subjects, and nothing required to be done beyond weeding, for all things are advancing of themselves, without any other wants than are naturally supplied. The China roses add their beauties to the others that abound.

JUNE.—Still nothing wanting; for if the ground be in good heart, it will do without water through a good deal of dry weather,—perennial plants being for the most part, when well established, able to seek nourishment at a greater depth than things recently planted, such as annuals, and transplanted subjects. Nevertheless, if there be any apparent flagging, let them have such a soaking as will reach down to the points of their roots, or let it alone altogether. The thorns are in flower, and many other subjects, rapidly adding their bloom to the general effect, or succeeding those that decline.

JULY.—Still nothing wanted but weeding, unless excessive drought should render watering necessary, which is not very likely. If the situation be much exposed, the hollyhocks may have a strong stake to protect them against wind.

AUGUST.—Merely a continuation of the same care: weeds are the only labour-making enemies, unless insects, such as earwigs, abound; but as none of the plants we have recommended draw them, this is not likely. Cut down all flower stems as soon as the beauty has gone; remove all dead leaves; support with sticks any tall subject that may be too much exposed.

SEPTEMBER.—Cut down the stems of things done flowering. Remove dead leaves and weeds from the beds and walks. Support any tall stem that requires it, and generally look to cleanliness.

OCTOBER.—The *Amaryllis lutea*, (yellow,)

colchicum, (purple,) and various protracted blooms, keep up the brilliance of the garden. The Michaelmas daisy and chrysanthemum brave the night frosts, and assert their privilege. Cut down all the plants that have done blooming to a tidy compact height, and from time to time remove all dead leaves. Leave the surface of the soil neat and level whenever you have to disturb it.

NOVEMBER.—Chrysanthemums, and sometimes the Michaelmas daisy, continue their blooms; and now the laurustinus and Christmas rose put forth their beauties to form pleasing objects, in the absence of more brilliant. The *Andromeda floribunda* is a striking plant, and fills up a gap in this time of scarcity. We have nothing to do now but trim down all untidy plants, remove all dead leaves and weeds, and let everything take care of itself.

We need hardly say that in all these necessary duties there is nothing which a female may not do, without demeaning herself to handle a spade or wheel a barrow, as recommended by some writers. The pruning of the roses, which is a simple operation, may be done by even a weak female, with one of the pruning pincers now sold at all seed shops: all that they require is, to nip out all the small weak branches and shoots, and shorten all the strong ones. But, in general, half an hour of an evening or morning, by the owner of the garden, may do all that such a garden wants; and once in about four or five years, when he has a day to spare to look after the gardener, he may employ one to cut the patches of plants smaller, to take up the bulbs and replant some of them, and to generally adjust the place for another similar period.

A few remarks too on the apparent crowding recommended in these plans. There is no necessity for putting one-half the number of plants in, if there be a desire for a more open looking garden. We have mentioned the extreme, because of the universal desire to have as many flowers as can be grown on a small space. It is to be considered, too, that there is more labour required to keep the vacant space in order than there is to keep it right when filled: weeds have not half the chance of coming up, and they are choked almost as soon as they appear, by the crowded subjects: then, again, although they are planted pretty close, so few of them are up at the same time that the place does not look crowded. Again, as soon as a plant is decayed it is cut down, so that, in fact, although the subjects almost touch each other, there is no period at which the garden looks other than rich in foliage, and fairly furnished with bloom.

*Rhododendron verticillatum.*

THE RHODODENDRON AND ITS CULTURE.

BY GEORGE GLENNY.

NOTWITHSTANDING the directions given by many writers for the preparation of the compost in which to grow this splendid plant, it has been found that the peat from our healthy commons is the best soil that can be obtained or prepared, and some of our best cultivators use only their natural soil, which is peat, or bog earth; that is to say, earth full of fibre and decayed roots, and not overcharged with loam. Beddington Park is the very best soil near London; and Messrs. Rollisson have the best grown plants in England, on that spot; we do not mean the largest, but the handsomest; the best grown, because they are the healthiest, the best formed, and the best furnished with foliage and bloom. Waterer, at Knap Hill, has also soil that produces this plant admirably; but as they are more crowded, they are not so well formed; perhaps they would be equal, with equal care in the culture. There are other spots of similar soil in various parts of the kingdom; and Wimbledon Common was so well adapted for the growth of American plants, heaths, &c., that tens of thousands of tons of the peat have been sold off the common for the purposes of cultivation. This must be getting more scarce; and as every body, as nearly as possible, chooses the best, it is more difficult to get good peat even

than it was years ago; nevertheless, it is to be had still, and all we have to do is to bear in mind that the sort that is best is that which is chiefly composed of fibre, run into one another, so as to completely mat together, and to come up and hold together in the lumps as they are chopped out. It is best to begin the culture of Rhododendrons with this or similar earth. Beds may be dug out four feet wide and eighteen inches deep, and filled with this peat, chopped into small pieces; and, until settled down by working for a time, it should be a few inches above the level of the path. But the beds must be well drained; there must be no stagnant water; which, if the soil happened to be stiff and undrained, there would be; for the wet would sink into the peat, and lay at the bottom, almost the same as if the space was open. Many of the nurserymen mix one-third loam with the peat, and this loam, such as comes from rotten turves. The effect of this is to give the soil more heart, and excite the growth of the plants much faster than they would advance on the pure peat. The same soil is used for pots; but in pots a portion of loam may also be allowed, because during all the young growth we may be excused for wishing a rapid progress. We therefore recommend

for the compost used in pots, two-thirds of the pure peat, broken into small pieces, and part crumbled, and one-third the mould from turves, cut from a rich pasture, no thicker than those in ordinary use for lawns. This, well amalgamated and rubbed through a corn sieve, is all that potted plants require; and the most that should be added at any time is a little well-decomposed cowdung, not more than one-fifth of the whole bulk. We have seen the *Rhododendron* flourish in ground more stiff; and many plants in parks and shrubberies, not made up for the purpose, but, on the contrary, what anybody would call too adhesive, are remarkable for their health and beauty; but of soil made for the purpose, there cannot be better than turf and loam, such turf being of the best quality. That they grow in America in ground more like a swamp than a garden is very true, but there are many circumstances under which they grow, that we do not supply; and consequently we have a good deal to do artificially, to supply those assistances which the plants have naturally, where they are indigenous. We ought to have the means of occasionally floating the beds with water, and especially during the hot months, in which they suffer so much from drought, if not properly supplied; for it is certain that they do best where the ground is at the bottom a swamp in the hottest weather. With the soil we have mentioned for beds, and the compost we have directed for pots, there will be no difficulty in raising and properly growing and managing this noble plant, which, from the time it is a foot high until its lofty branches vie with the prettiest of our flowering trees, is always beautiful.

OF THE VARIOUS KINDS OF RHODODENDRON.

It is not our intention to attempt a list of the species and varieties of a subject which has been named by many people in a most arbitrary and ridiculous manner, because, on the one hand, many diverse names would describe but the same thing, and on the other hand the varieties called hybrids, which mean no more than variations from seed, are becoming so numerous that the task would be vain. There are some remarkable enough, and, in consequence, popular enough, to justify a mention; but every year produces better things in the same way, or distinct improvements, until old and once valued sorts are cast aside as common, and only worthy of the common shrubbery or of the wilderness. Hybrid varieties, strictly speaking, are crosses between plants of opposite natures in some particular, and which, therefore, partake more or less of either parent, as the case may be, or of both in very nearly equal proportions. As an instance, we may mention

that some of the North American varieties are as hardy as an oak, while the Nepal mountains supply us with more tender kinds, but with flowers of far greater brilliance. The various cross-breeds between these tender and hardy kinds, have produced splendid flowers upon the hardy constitutions; and in this the hybrids become the more valuable, as they stand in the open air. But names sadly confuse us, because everybody who has raised these hybrids, many of which, naturally enough, come nearly alike, considered himself at liberty to name the production; so that we have *Russellianum*, *Cunninghamii*, and twenty more names, to the same description of hybrid.

Rhododendrons, in fact, have become as numerous as almost any florist's flower; and from a multitude of seedlings it is very difficult to find one of which there may not be found twenty, or a hundred and twenty, like it. Nevertheless, there are some kinds which are very distinct, and seem to keep up their distinctive character. *Catawbiensis* is, with its hundreds of shades, raised from seed, the very best of the hardy kinds; the foliage is richer, the flowers better formed, the habit first rate. And although you may find every shade, from deep purple to white, through all the gradations of rosy purple or lilac purple, the habit of the plant is beautiful. The flowers sport in colour; but the growth, habit, and rich foliage seem in all pretty much alike. *Campanulatum* is a very beautiful shrub; and although many have been raised from seed, and consequently there are many shades of flower, it is, in all stages, a handsome, hardy, and excellent species, or variety, whichever it may be. *Arboreum*, and its many varieties, more or less tender, are fine; and the hybrid varieties raised from it are both rich and numerous. *Caucasicum* is a distinct variety; and though not remarkable for the gaiety of its bloom, is very well worth a place in all collections. With regard to hybrid, or English varieties, there is no end to them, and there is no describing them. Mr. Smith, of Norbiton, has made the most extraordinary inroads; he has produced bright and pale yellows, and bronzy hues, that no one could imagine would ever be obtained, and his white and scarlet hybrids are very beautiful. Mr. Waterer produced also many grand varieties from seed, and named a portion of them; but it is too wide a field to enter upon a discussion of hybrid or seedling varieties.

If any one desires to choose a collection for their colours and habits, let him go to Knap Hill, to Norbiton, to Beddington, and Tooting, and pick them out in bloom; for to grow a collection *by name*, unless confined to the species (so called), would be quite a task, and not a profitable one. Among the scarlet hy-

brids *Alta-clerense* is admitted to stand foremost, on account of its possessing the richness of arboreum from Nepal, on the hardy plant of North America; but, no doubt, there are scores of hybrids raised from the same parents, and entitled to the same notice. The capacity to stand out of doors, through an English winter, is absolutely necessary to give much value to a *Rhododendron*; and as a plant in a well laid-out shrubbery, there is hardly anything more valuable.

RAISING FROM SEED SOWING.

The seed of the *Rhododendron* is as small as dust, and unless carefully saved in an earthen vessel, would be much wasted. It would escape through the smallest fissures or cracks in a box, and paper could hardly be opened and closed without a good deal being flapped away or blown away. To sow it, let it first be mixed with five or six times its quantity of sand; then prepare some seed-pans or large flower-pots, by filling them with the compost above mentioned. A few crocks should be placed at the bottom, to secure good drainage, and the soil or compost should be rubbed through a coarse sieve, to keep out large stones and large lumps of the turfy peat; strike the pots or pans gently on the table, to settle the compost a little, and level it with the edge of the pan. Upon this level surface sow the seed, as thinly as possible; if it could be done, we would have the seed half an inch apart, all over the pan or pot; but the thinner and more evenly the better. Then sift some of the compost through a very fine sieve, just enough to cover the seed, and no more. With a very small quantity of seed a dozen pots or pans can be sown quite thickly enough to do well. There are several ways of watering this seed, but there is some difficulty in preventing it from washing up and swimming out of its place in the water, if the water be allowed to lie on the top. There are syringes, made with tops, in which the holes are hardly perceptible, and by means of these, by standing at a distance and pointing upwards, we can send forth the water as fine as any dew, and so completely saturate the pans of earth without so much as disturbing a grain of seed or of earth. Others, however, stand the pans in water, an inch deep, and so let the seed take all the moisture it has from the bottom. Others again wet a common clothes brush, turn the hairs upwards, and by drawing the hand along the hairs, throw off the water in such small particles that it cannot disturb anything. All these ways answer; and a friend of ours, who was always making discoveries, determined to beat them by a plan of his own, which is well worth mentioning, only to show the difference between theory and practice. He had a

watering pot made, with a rose in which the holes were so minute that he was going to sprinkle the pans with finer dew than even the syringe; but with his finest rose the water would not run out at all, and with one a trifle larger the water oozed out through the holes, collected in large drops, and failed. The force of a syringe will drive out the jets of water so fine as to be almost imperceptible, whereas, without the force, water would only run through as it would from a cloth, and fall in large drops.

These pans should be placed in the greenhouse, with glasses over them, as in the cold pit; but glasses are necessary, partly to keep the moisture from evaporating, and partly to keep off draughts and drying winds, when the doors and windows are open.

There are a few little points to which attention must be paid; first, the soil with the seed on it must on no account get dry until the seed is up; next, when the seed is beginning to vegetate, a piece of transparent calico, or a sheet of paper, must be so placed as to keep the sun from the young and tender plants. When this stage is arrived at, the glasses may be taken off mornings and evenings, and only put on in the night and the few middle hours in the day, when the shade of the paper and occasional watering will continue to be necessary. The plants will very soon attain sufficient size to enable you to prick them out, and advance them another stage; the rule being to prick them out as soon as they are large enough to handle.

In pricking these out, as before was done for the seed, prepare pans or wide pots; these must be well drained. Level the soil even with the top of the pot or pan, giving it two or three thumps on the table, to close the earth a little. Take the seedlings from the pans one at a time, or more, by digging or raising them up with a sharp pointed stick flattened like the blade of a knife, leaving on the seed pans or pots enough plants to stand an inch apart all over; and if there be any vacant spots where they are farther apart, as will be the case if the seed missed, put in a few from other parts of the pan to fill up properly. Prick out the seedlings that you take up into the pans and pots newly filled, and beginning close to the edge of the pots or pans, put them in all round one inch apart, then begin a row an inch nearer the centre, planting the latter seedlings in another circle, and so complete the rest of the pans, until all the seedlings removed from the original seed-pans are provided for. The seed-pans should then be stirred a little, and levelled, without disturbing those left in, and gentle waterings, as at first directed, be given to the whole. These may all now be placed in the cold frames out of doors, or in the greenhouse. It will be

easily understood, that when the roots hardly reach the eight of an inch into the soil, the greatest care must be observed that they do not lack water, and that if this be not given as carefully as it was to the seed, the plants will easily be washed out of the soil, and the roots laid bare. In this way they may be left to grow, with no further attention than watering when they want it, and for a few days shading them from the extreme heat of the sun. When they have established themselves, they may be moved into a common garden-frame, into some situation where the mid-day sun will not touch them, and they may have genial showers, plenty of air, and be only shut up at nights. A few months will advance them far enough to touch one another, and they may then be otherwise disposed of.

POTTING AND PLANTING OUT.

We are presuming on the seedlings being from seed of hardy plants, and therefore that as soon as they are large enough, they will bear the open air. Level one of the four feet beds prepared for the reception of plants, and in this plant all the seedlings six inches apart every way, or, if room be scarce, three inches apart, in rows, and the rows six inches from each other, and well water them in. The greatest care must be taken in planting, that the seedlings are not put deeper in the ground than they were in the pans, for it would kill many if they were too deep. Here they must be frequently watered, protected from the rays of the sun, and be covered against inclement weather. The most common thing is, to hoop over the bed, so that mats can be thrown over at any time, and especially at nights. But if you have a garden frame that can be spared, you may put six inches of the peat earth into it, and plant out the seedlings six inches apart all over it: the glasses may then be put on or off, according to the weather; and they are easily shaded, by throwing mats over them. In this they may grow until they nearly touch each other, when they will be strong enough to stand in the beds six inches apart; but if it be doubted whether all are hardy, or if the seed has been saved from the tender kinds, they should be potted from the frame in pots size thirty-two, in the same sort of earth as they were sown and pricked out in, carefully inserted the same depth they were growing in the former; and they should be taken up for that purpose with the earth about their roots, and without breaking any of the fibres. As all seedlings are anxiously looked to for new varieties, they should be allowed to grow without any check until they flower, which would be greatly delayed by the loss of the leading shoots. But the foliage and habit of the plant will some-

times indicate novelty, in which case it may be hastened in the bloom by grafting the leader on a healthy common stock of two or three years old, which will thus impart all its strength to the leader thus grafted. But to revert to the potting: they should be shut up in the frame again, and will be all the better for plunging the pots in the soil already there, as it preserves the sides of the pots moist, and greatly encourages the growth.

FINAL PLANTING OUT, OR GROWING IN POTS.

The plants ought not, when left to grow and bloom, to be less than one foot apart every way, so that after they have been put out six inches apart, they will require one more remove, when they will make three rows down a four feet bed, and then they may remain to flower. The worst of them will be an evergreen shrub, and far better than the *Rhododendron ponticum*, for unless the seed was saved from a better, they would not be worth the trouble. They must always during the hot months be well soaked with water. One half the *Rhododendrons* which fail, or whose buds do not set well for bloom, are starved into the failure by want of moisture, for they make their growth in the hottest and most trying months; and seedlings, in making their growth, are more susceptible of a check than established plants. Those which are potted in thirty-two sized pots, require only to be well watered; and when the frost is likely, or there is even a chance of it, the glasses should be closed. It is not desirable to increase the size of the pots, if it can be helped, until they bloom; but such as take to growing much may fill out the thirty-two sized ones so completely, as to actually require either enlarging the size or planting out. It may also be necessary to raise the frames, to make room for the height of the plants. This may be done by placing bricks under the corners; and any vacancy it may make under the frame may be stopped by piling turves outside. We have seen plants ere now growing five or six years without blooming, and then bringing nothing worth the trouble, because not better than we possessed already; but these things will always occur with seedlings, and we must not be deterred from raising by the failure of a score or two. Those, however, who profess to raise seedlings should continue sowing every year. But we should always recommend hardy parents, or at least the seed of the hardy parent in preference to that of the tender kinds, first, because there is less trouble, and next, because the plant is worth more if you obtain it hardy. The showy greenhouse varieties of *Rhododendron* are very beautiful; but so are the hardy ones when grown with care, bloomed in pots, and produced full of flowers.

BLOOMING THE SEEDLINGS, AND SELECTING SORTS.

There are so many fine varieties of the Rhododendron, that it is not worth while to save any second-rate thing; yet as evergreens they are always useful in borders and shrubberies. As, therefore, the plants come into flower, look for those which have some characteristic that others have not—a very noble foliage, or a very beautiful habit, with any novel colour or remarkable bloom of good form and substance; and with a label sufficiently large to be easily seen, either number it and describe its character in a book under the same number, or put the particulars on the label itself. Now we have arrived at the period in which our selections are to be made for keeping or rejecting altogether. Be not tempted by any second-rate things. Let there be some very distinct point to justify keeping. The flowers, in the first place, should form a very distinct, compact, rounded cone, with foot stalks short enough to keep every flower in its place. Many of these varieties, which have been sold at high prices, and propagated largely, have this very striking fault: the foot-stalks of the flower are so long, that the flowers do not touch each other, you can see between them; and one, which from its extremely delicate colour was a good deal prized by the late Mr. Waterer, and called *Glennyanum*, was of this description. When it was opening, it was pretty enough; but before it is in full bloom, all the cones or trusses of flowers become loose, and to our notions this renders the variety worthless; and we venture this opinion, although it is very popular, and specimens of large size, and beautifully grown, have been exhibited time after time. We cannot, therefore, too strongly impress on the minds of the seedling growers the necessity of rejecting all such as have loose trusses of flowers: there ought to be no vacancy between them; there ought not to be a stalk seen. The cone of flowers should be based on the upper circle of leaves, and not a shadow of stem or foot-stalk should be perceptible above these leaves. The rounder the individual flowers are the better we like them; but the closeness of the cone should be imperatively insisted on before any variety should be pronounced worthy of a name. All the loose ones should be given away or thrown away, for by comparison they are not worth a place even in the garden. In the first place, the bloom looks untidy the instant it grows and loosens, which, when the foot-stalks are too long, is before it fairly blooms out; and upon one of these loose trusses the wind and rain have so much power, that the bloom is ephemeral—hardly worth looking at when it has begun to open. But a very moderate

claim in other respects will justify us in selecting a plant of good habit and fine close truss: at all events, so long as they were occupying a space in the borders or clumps. We may in fact say, that although a variety may not be worth propagating, because of there being no novelty in the colour, it may be, and in fact will always be worth saving as one of the best kinds we can encourage in the shrubbery. Carefully label all that exhibit this compactness, and as carefully exclude all that are loose, for they are worthless. Of those we select we should make some memoranda on labels or in books to which labels will refer, stating their colour, character, habit, and anything remarkable about the foliage. If there is anything new in the colour, as well as in the form of the flower, so distinct as to be worth propagating, we must decide upon how we mean to propagate: we have to choose between layering, inarching, and ordinary grafting, and to provide accordingly. The first thing to do after blooming is to let the plant grow as fast as it will, by abundantly supplying it with water, and room. For this purpose, if it be in a pot, plunge the ball of earth as you turn it out of the pot into the regular peat bed; this will give it room, and all the time it is growing it must not be neglected a day. By the autumn all the new growth will have been made, and the plant set for bloom, or otherwise. You have now an opportunity of inarching, layering, or grafting; the longest and lowest branches, that are easily laid down, may be carefully slit half way through at a joint, and pegged down in the ground a good two inches below the surface; this may be done in the autumn as soon as the growth is perfected, and will require no care till the next autumn, when it will have rooted and made a season's growth, and may be cut on the stool side of the root, leaving a small portion of the old plant on it; other branches not so easily brought down, may be inarched, if desirable, by placing the stock, which should be in a good-sized pot, and be of some strong hardy kind, like the *ponticum*, by the side of the stool, and then taking the strongest shoot of the stool that stands the most handy, cut the stock half through, so as to make a flat side to it, and then bend one of the branches of the stool, cut in the same way, and tie the two flat sides together with matting, leaving both of them to their fate, only taking care to supply both with water, and protecting them a little, if necessary, against the inclemency of the weather. Most of those who regard their plants, have a common garden frame propped up to a proper height, or form a peat bed at the bottom of a regularly built pit, so that there is always protection. With regard to grafting,

the ends of the shoots to form the graft are cut off the stool, healthy growing stocks are procured in thirty-two sized pots, and a moderate hot-bed is prepared by which the newly grafted stocks can have bottom heat. The stocks are cut down pretty nearly to the earth, say within three inches of the bottom of their stems; they are then cut to match cuts in the grafts in some way or other, so as to fit the bottom part of the graft to the top part of the shortened stock; we don't know that it matters—indeed, we are convinced from experience that it does not matter—how the cut is made, and the join shaped, so that the stock and the graft fit perfectly close, and the bark of each touch each other. The pots with the grafts may now be placed in the hot-bed, (which should not be very much excited,) and regularly supplied with water, and a little air in the middle of the day. Upon the regularity of the heat, and the constant attention to watering, much depends, but there is very little doubt of their taking, as it is called, that is, uniting.

FURTHER OPERATIONS IN PROPAGATING..

In due course of time the layers will require to be cut off the stool, and the inarched parts separated from the main plant; those taken from the stool, after laying, should be taken up with all the fibres upon them, and be planted out in peat beds, or potted into such sizes as the rooted plants require, and be labelled like the parent plant. The inarched plant must have the head of the stock cut off, and all the stock but the main stem below the join trimmed out; nothing must be left growing but the piece of the new plant that has united itself to the stock, and this plant must receive a similar label. With regard to the grafted plants, they will not be so strong as the others, because both the layers and the inarched portions received nourishment from the parent plant all the while they were establishing for themselves a new means of existence, one from roots of its own formation, the other from the stock to which it was united. All these plants, however, require the same treatment; they may be planted out in peat beds to make a year or two's growth, or repotted in larger pots to allow of their increase in size, or be placed in prominent situations in the shrubbery or flower borders, where the earth is prepared for their reception. In the open ground nothing can be done for them beyond supplying them with plenty of water in hot weather, and especially while making their growth after bloom, and cutting away any wild growing, or straggling branches that would get the plant out of form. The grafted ones must be examined to see that no part of the stock is allowed to grow; and if the

branches come a little too crowded, which will often be the case, remove them while young, that those which are to grow may be the stronger.

MANAGEMENT OF PLANTS IN POTS FOR BLOOMING.

As there is not a more showy plant for conservatories, drawing-rooms, and exhibitions, those who profess to grow a collection, always keep some of each variety in pots, or so contrive things as to be able to command a good show, removable at pleasure. The hardy sorts may be thus managed with advantage. As soon as the flower has gone by its perfection, remove very carefully the bunch of footstalks of every truss, but you must be very careful not to cut off lower than the lowest flower, because at the very end of the branch there are three or four buds which must be preserved for the next year's branches. Now turn out the balls of earth whole, and plunge them into a regular peat bed, at such distances as will allow of a season's growth without their touching each other; before they begin to grow, remove or cut back any branch that seems too long for the others, for it will be often found that besides a neat bushy plant, there will be one or two of the stems run up far above the rest, and although their bloom saves them until the flower is gone, they should be removed, or at least cut back, or the plant would in another year be out of all character, for the growth at the ends of these vigorous branches would take the lead, and the bushy or handsomest part of the plant could not even set for bloom. When these plants are well watered, so as to settle the peat earth about their balls, they will make much more healthy and rapid growth than they could in their pots, and by the autumn will have set their blooms, or otherwise. There will be some set with buds all over, others partially, but from this bed you take up and pot all the plants that are to grow in pots, and by a good stock of the family, you are enabled so select as many as you require. The Rhododendron will not flourish the less, nor be the worse from pulling up every autumn, and planting out again every spring after bloom, if the sorts be hardy; and those who adopt this system possess the means of beating every body who relies on the pot culture alone. The plants are the better for making their growth in the comparatively poor peat earth, and the bloom the better for bringing forth those flowers in the richer earth that is made to surround those fibres in the pot. Plants that are only partially set for flower, are not worth the trouble of potting, because there is not enough bloom to make them objects of great beauty, and,

unless they are, they ought not to be seen in the drawing-room, the conservatory, or an exhibition.

SAVING OF SEED.

For this purpose select some of the best formed varieties of the hardy kinds, varying the colours as much as possible; plant them together in a peat and loam bed, made of the compost recommended for pots. Select none but those of good habit and good form, unless it be for the sake of colour; there should be the best formed white, crimson, scarlet, dark purple, light purple, and yellow; all but the yellow can be found in excellent character, and the yellows are some much better than others. By planting these out together there need be no pains taken in impregnating one with the other, nor do we believe this is done half so often as it is talked about. If, when these are in full bloom, any of the larger and more noble specimens of the tender kinds are in flower, cut one of the trusses directly the pollen is ripe, and put it in a phial of water tied to the end of a stick, and by placing the stick upright in the soil among the plants and the flowers, about level with some of the others, there will be a mixture of the kinds and colours, and perhaps habits, far more varied than if impregnation were done by hand, according to our notions; for it is impossible to say much about the effect of crossing among flowers, though there may be something known of its effect among fruit. We remember to have tried very hard to keep the seed of a dahlia true. The King of the Whites had been imported that season; in a new piece of ground turned up from grass we put out two weakly plants, and there they bloomed alone: there was nothing very near to hurt the seed, and we saved two pods. Not a solitary white dahlia did these seeds produce; there was a dirty pale yellow, several edged flowers very full of calyx, and all the shades of red and purple. Mr. Edward Hopwood crossed the King of the Whites with a scarlet the same year, and the seed produced nothing but dirty purple and lilacs; we therefore believe that there is more chance of good things, and new things, if we place the best together, and let nature's agents perform the work, than if we attempt it ourselves, for there is something in natural affinities as well as chemical affinities, and where a thousand agents are flying or crawling from flower to flower, it shall be there must be a better chance of success than when there is only one, and he not the best judge of the means to effect his ends; not but that there are some things so palpable as not to be mistaken, but in a general way it must be remembered that during the bloom every change that can be tried, is tried by the

thousands of insects that go from flower to flower, carrying the pollen of all in small proportions, and leaving it in such of the pistils as are ready for it. Cut off all the flowers from all the plants except the handsomest and best truss, that all the vigour of the plant may be thrown into the one head of bloom, and let the plants be growing where they have all the sun and rain, and wind, that may come to their share in an open space; we do not mean that it may not be somewhat sheltered from violent storms of wind by a fence or wall, or distant trees, but no artificial protection. Being only one truss of bloom in each, there will be no danger of the seed, provided you keep them well watered; and when these have swelled well, they must be watched, so as to be gathered before they burst open, or the fine seed would be lost.

RHODODENDRONS AS STANDARDS.

There is nothing more simple than the growing of this noble shrub as a tree, but for the most part the tree Rhododendrons of the nurserymen are portions of large ugly grown bushes, from which the most strong stem is selected to grow, and the other portions of the bush are cut away. In this manner whole quarters are filled with overgrown rhododendrons, naked at the under part, and most of the stems grown up to more than ordinary height. In these the tallest and most straight stem that rises all the way from the ground is marked for saving, and all the rest cut away, no matter whether the selected stem grows upright, or stands out sideways; this part of the affair is accommodated by digging up the root, and replacing it in the ground so much canted on one side or the other as to bring the stem upright. In doing this, if the root, as it often happens, is very spreading and clumsy, half or often a good deal more of it is chopped off with the spade; a whole piece of standards is thus soon formed. The thing may be better understood by the following—The side shoots are immediately cut off close, half the root of some, when they are too big, is cut off also, and they are planted in the ground so that the stem is completely upright. If this be a very common rhododendron, a good variety is grafted on the top; if on the contrary it be a good sort, the top three shoots are left to grow, and all the others are cut close, but the three top ones are cut back to leave three eyes each to induce side shoots. At the end of a season of growth there may be head enough, if not, the most vigorous of the shoots must be stopped or cut back again. The regulation of the head till it becomes a good specimen may take some time, but no shrub will more readily obey the cultivator if he begin in time. But if we have to rear

standards from the seed bed, we allow them to grow upright until they are as tall as we require the stem, contenting ourselves with cutting off the lower side branches, and leaving the growing part only one-third down the whole height; and when there is as much straight stem as is required for the trunk of the tree, we may cut up the sides to within three good branches, as recommended for the old shrubs to be turned into standards. Upon these young and healthy stocks, with roots of a healthy dimension, and in the soil they are raised in, do we graft the better sorts of the plant, but as we do not know the value of the stock itself until we see it bloom, they are allowed to bloom before they are finally cut to form the heads; if there is any merit in the variety, we should naturally prefer the whole tree to a grafted one; as there is less interruption to its progress, it soon attains a good head, and if there be any odds, must be sounder than a grafted variety. Except therefore cutting the lower branches up every season so as to leave only four or five strong shoots at top, we recommend letting the head have its own way till it flowers; if it prove worthless or poor in the flower, you may inarch or graft it by cutting back the three or four branches at and near the top, and graft on each, or cut them entirely in and put one graft only on the leading stem. The one produces a head sooner than the other.

In humouring the growth of straight stems for standards, this plan should be adopted. The stem should be trimmed quite up till it is as tall as it is wanted, when you may begin to form the head by trimming close up to the last year's growth, and the head may then be made of any form or plan, by encouraging the growth where we require it, and pinching out the heart where we wish it to be checked; nine-tenths, however, of the standard trees have been formed of old uncouth specimens that have grown out of shape as shrubs, and offer every temptation to make some moderately formed branch into the trunk of a standard, or even into the standard itself.

PROPERTIES OF THE RHODODENDRON.

1. The flower should be circular and campanulated, or hollow like a globular cup.
2. The five divisions of the corolla should be concealed by means of the lapping over—and it should be large.
3. The corolla should be thick, smooth at the edge, stiff, and hold its shape well.
4. The truss of blooms should be pyramidal or dome-shaped, stand clear of the foliage, the flowers compact, touching, but not crowding each other.
5. The footstalks should be stiff and elastic.

6. The colour should be brilliant, the spots distinct and contrasted, and stand well without fading.

7. The plant should be bushy, the foliage bright clear green, large, and disposed all round the branch, especially beneath the flowers.

8. The stems should be well covered with leaves, and the bloom should be abundant.

9. It should not bloom until the middle of May if hardy, as by opening before the frosts have gone, the blooms are always spoiled.

The following would be considered great faults:—The corolla thin, notchy, frilled, or crumpled, the divisions narrow and pointed, the flowers loose in the truss, the footstalks weak and too long, the colour dull, the spots not bold nor strong; the foliage narrow, dull, and far apart; the habit lanky, plant straggling and ugly.

MONTHLY TREATMENT.

JANUARY.—In this month we are taking plants that have been potted into the forcing-house when we require them to be early; others having been taken in during November and December. Those which have been in the forcing-house until their buds are swelling, or perhaps bursting, must have abundance of water; indeed, all these shrubs must be well moistened when out of their proper element. Those plants in pits, in whatever state, must have air on mild days; a genial shower of rain will not hurt them, but they must be covered up against frost if they have been used to the frames through winter, otherwise they would have a check that would hurt the flower if not the plant. Autumn sown seedlings will sometimes not come up till the spring, and there will be occasionally, from some trifling neglect, a good deal of difference between the time that the seed takes to germinate. The seed pans must, however, have moisture in whatever state they happen to be, whether the seed has started or not. If there be any seedlings large enough to prick out, do it as directed.

FEBRUARY.—Sow seed in pans or large pots; look well to that already sown, or up, or pricked out. The plants out of doors in beds may take their chance; those in pots must be artificially supplied with water and shade from the very hot sun, and frost must be kept off, for although they would be perfectly secure in their own beds, they cannot stand so much severity in pots. Those which are forcing must be well watered; as they come out into flower they should be removed to the conservatory, or the drawing-room, or wherever their beauty is to be expanded. Put out those for seed in a peat bed, giving them plenty of room, but no more than good room, because the nearer they are together the

better, and they must be plunged up to the surface, but turned out of pots.

MARCH.—Many of the early sorts, or those a little protected, are now swelling their buds, and must be well watered. Seedlings that are large enough must be pricked out, and any that have grown pretty well after pricking out will soon require to be potted, or planted out. The potting may go on at any time, or all times, but you can only be preparing for planting out; see therefore to the preparation of peat beds, in which they will require to be planted as directed, keeping the seedling beds, and even the potted plants clear from weeds, as quite a necessary duty, for they come much faster than they are welcome. Sow seed, if not done already.

APRIL.—Now, many that are housed are flowering, or bursting their buds, and they should be taken where they are most wanted. Those in the frames should have plenty of air in mild weather, all the mild showers, and be shut up in the night; as well as this, they must have mats over them if there be any chance of frost. You must now begin examining seedlings, for they will many of them be in flower in warm situations in the course of the month. Stir the surface of the pans in which seedlings have been pricked out, but do not disturb the roots, for they have but little hold. Any of the earliest forced things that are getting out of flower should be removed to cool situations to make their growth; therefore, as the flowers decay, turn them out of the pots into beds of peat, protected by glass when necessary, but where they can, let them have all the air and rain when the weather advances a little.

MAY.—This month you may plant out seedlings that are large enough, in the peat beds prepared for them; so also you may the plants that have completed blooming, and let the ground be well soaked. Throw mats over them by means of hoops crossing the bed, whenever there is any appearance of frost, or extremely cold rains or winds. Prick out seedlings into other pans, leaving them in the original seed-pans about an inch apart, and planting them out in others just the same. Examine, and reject, or mark for approval, all the seedlings that come out into flower, omitting in the good ones no point of description, that we may the better understand what they are when we have no bloom to look at. From now till the end of June the seedlings will keep opening, that is to say, those which are sufficiently old, but this is to be noticed a long while beforehand, as they set their bloom-buds in the autumn. Pick off the foot-stalks of the flowers as soon as the bloom decays.

JUNE.—The great majority of the out-door plants will now be in flower, and the

marking of the seedlings may be pretty nearly complete. Abundantly water all of the plants in every stage; they will now be opening their blooms or making their growth. Continue to turn out in the open ground all the plants that have flowered in pots. Prick out and plant out any seedlings that have not been done, and are ready; they ought never to go longer without thinning than till they begin to incommode each other by crowding, and after pricking out, the same direction applies. As soon as they touch each other they should be potted off singly into pots, or be planted out; take especial care to water those plants which are grown away from the rest, to save seed from. Pick off the stems of decaying flowers from all other plants than those.

JULY.—The management is the same as the last month throughout, the only difference between the plants being their further growth, and they require all that we directed last month to be done, so far as watering and weeding and attendance are concerned, and as soon as the bloom is over, picking off all the footstalks of the flowers. Sow seed if not already in.

AUGUST.—Many of the plants have now made their growth, or a good way towards it; they may therefore be layered, inarched, or grafted, as soon after they are set as possible. Confine the layering or the cuttings for grafts to such shoots as have no flower-buds, or pinch out the flower-bud, for the plant rarely moves while the buds are swelling or the flower opening; it seems to take all the nourishment the plant can give. Water, prick out, plant out or in pots as wanted.

SEPTEMBER.—Continue the propagation if necessary. Throw away, or give away, or plant in the commonest and least frequented positions for the mere purposes of underwood, all the rejected varieties from among the seedlings, and all such as your seedlings have fairly beaten. Look to the plants put out for bearing seed, and when the pods are pretty ripe, whether it be this month, next, or the month following, gather them into a deep pan, or something glazed inside, that none of the minute dust be wasted; for it is little other than snuff in appearance, and not half so coarse as some snuff.

OCTOBER.—Look over the potted plants that were turned out into the peat beds, and see which are sufficiently well set for bloom to pot again for the usual removable collection; take them up carefully, and pot them in such sizes as will not require their balls to be reduced, but it does not matter how nearly they fill the pots. See that the compost be pressed down all round them; they may then be plunged again into the peat in the cold frames or pits, or be placed there without plunging, but double care must be taken that they never want for

water, because it is difficult to soak the earth in a pot when out of ground compared to the watering when it is in the ground. Water the seedlings, continue propagating, if it be not all done.

NOVEMBER and DECEMBER require nothing more than a continuance of the treatment recommended, except that if forcing any into bloom early is made an object, let the forwardest of the plants be taken into the forcing house, stove, or greenhouse, and continue a succession during those two months, and the following months as already directed.

WILD FLOWERS.

THE OXALIS ACETOSELLA.

IN our gardens and greenhouses may often be seen certain small herbs, with showy blossoms and clover-like leaves; these are species of *Oxalis*, of which very many kinds, natives of the Cape of Good Hope and South America, are from time to time seen in cultivation—not all, however, possessing the clover-like foliage; this characteristic is confined to a group of the oxalises of some extent, and to which belongs the British species *Oxalis Acetosella*, the common wood-sorrel, or sour trefoil.

This little plant is exceedingly ornamental, decorating the moist woods and shady hedge-banks in many parts of the country about the latter end of April and in May, with its numerous delicate blossoms, which, indeed, in lofty Alpine situations, are produced as late as August. Underground this plant is furnished with long, creeping, cord-like stems, from which, at intervals, are produced tufts of fibres, and scaly fleshy rhizomes which are analogous to bulbs. From these rhizomes the leaves are directly produced, without the intervention of a stem, each leaf being supported by a hairy stalk of moderate length, by which it is elevated two or three inches above ground. The leaves are composed of three inversely heart-shaped leaflets, more or less clothed with soft short hairs; the upper surface of a pale but cheerful green, the lower surface being paler and often acquiring a deep purplish tinge. The flowers, also, spring from the rhizomes, and are borne on stalks, which are long enough to elevate them slightly above the leaves, and bear above the middle two small scaly bracts. The blossoms—large and showy for the size of the plant—are composed of five oblong petals notched at the end, and these generally expand about far enough to form the outline of a bell-shaped flower, seldom wider; they are produced singly at the end of the scape or stalk, and are somewhat drooping; the petals are white, finely pencilled with purple veins. In a variety, not often met with, the flowers are of a purplish colour. At the

base of the petals, where they are narrowed into a short claw, there is a gland on each side, and by means of these glands the petals are united together. In the interior of each flower are ten stamens and five long slender styles bearing feathery stigmas. The seeds are numerous, in a narrow five-angled capsule, which is five-celled, and, when ripe, bursts open on the slightest touch, scattering the seeds to a considerable distance.

The wood-sorrel is frequent and abundant in groves and shady places, “studding with its veined flowers the sides of romantic ravine-like lanes, amidst stones, and moss, and fern; or not unfrequently its triune leaves and white drooping flowers cover over the declining moss-covered trunk of a decrepid tree with a wreath of nature’s own approval.”

The leaves of the wood-sorrel have a singular sensitive property. During the day-time the three leaflets mostly assume a horizontal position level with the top of the stalk, but, on the approach of evening, the leaflets become deflexed almost parallel with the stalk. This property, which has been noticed in many other instances, is sometimes called the sleep of plants, and both simple and compound leaves have been observed to be thus affected; the former in their totality, the latter not always so, but sometimes partially. Some trifoliate leaves are found to bend their leaflets so as to bring the base and summit nearly in contact, leaving a cradle-like cavity in the middle, which often serves as a protection to the flowers; some bend them by the lower half and leave the summit divergent; and some bend them down so as to face by their inferior surfaces, as in the *Oxalis*. Of pinnate leaves, some erect their leaflets so as to meet above the petiole face to face; some bend them down so as to meet below the petiole by their under surfaces; some fold them up above and along the common footstalk, so as to overlap one another in a direction towards the summit of the petiole, as seen in the sensitive plant of our hot-houses, in which there exists this further peculiarity, that while the leaflets bend upwards the main petiole bends down; some others fold up and overlap like the last, but in a direction towards the base of the petiole. The cause of these phenomena is not certainly accounted for, although light appears to be the operating agent: light acts upon leaves as a stimulant, and darkness, or the absence of light, acts as a sedative. It is in the leaves that the fluids of the plant undergo the necessary elaboration for perfecting the structure of the plant, and forming its peculiar secretions; and as light is the most important agent in working these results, we see that during the daytime the leaves are so placed as to be fully exposed to its influence. It has

been suggested that this change of position in the leaflets may affect the plant with reference to the evaporation and absorption of moisture, the expanded leaflets projecting over the roots, preventing so great an amount of evaporation from the soil during the day as would otherwise take place, and the drooping leaflets fully exposing the roots to the deposition of dew during the night : this explanation is rather fanciful. The effect, however, does appear to be partially produced by the agency of moisture, as it may be accelerated by dews and rains, and is even produced by artificial watering. Probably the proximate cause of the change of position is the difference of temperature between the day and the night, which difference is, in a degree, simulated either when rain falls or water is artificially applied.

The leaves have a pleasant acid flavour, which makes them, in *small quantities*, a very grateful addition to a salad ; and many a botanist, after a fatiguing ramble, has paused in the shady company of the wood-sorrel and refreshed himself with its agreeable acid juice. It is proper, however, not to use it too extensively, as the juice in which this acidity resides, consists of oxalic acid, which substance, in fact, derives its name in consequence of its presence in these plants. Twenty pounds of the leaves yield about six pounds of juice, which gives, on evaporation, about two ounces and a half of an impure crystallized salt ; this, when properly purified, forms flat semi-transparent crystals, intensely sour and actively poisonous ; so much so, that half a drachm has been known to cause death, and a dose of half an ounce is rapidly fatal. The oxalic acid of the shops is not now prepared from vegetables, as a process has been discovered by which it is procured more readily and economically. Mixed with cream of tartar, oxalic acid was formerly sold under the name of salts of lemon, in which form it was used, among other things, in removing iron-mould, ink-spots, and stains from linen ; now, however, that the real salts of lemon—citric acid—has become cheaper, it is not much used.

The plant is said to be eaten by goats, swine, and sheep, but is not relished by cows, and is refused by horses. Used with precaution it is, as already intimated, an excellent ingredient in spring salads ; and, in fact, other species of *oxalis* cultivated in gardens yield a similar ingredient throughout the summer. In fevers the leaves boiled with milk form a pleasant and refreshing drink when the curds are removed from the whey. The leaves beaten into a conserve with thrice their weight of fine sugar, are not unfrequently employed under the name of *Conserva Lujula*, for their cooling and thirst-quenching properties.

It is the triune leaves of this plant which are now believed to be the original Shamrock of St. Patrick, instead of those of the clover, which have been sometimes so considered.

As one of the early flowers, no less than for its delicate beauty, the *Oxalis Acetosella* should be planted in every garden. In shady shrubberies, shady borders, or even under the shade of isolated trees or shrubs, the ground should be thickly planted with its scaly rhizomes. The best time for removing them is after the flowers have faded, and when the leaves manifest indications of decay, for they are then readily found, and transplant without injury. They should be planted about three inches deep, so as to be out of the reach of the hoe and rake in the ordinary operations of summer cleaning. In the spring their elegant foliage and delicate blossoms would prove very ornamental when the earlier snow-drop, winter aconite, and wood anemone had faded ; and while the flowers of the parterre were comparatively few.



THE POLYGALA VULGARIS.

On most of our barren-looking common lands, but especially upon dry heaths, there will be found, at this season of the year, numerous little patches of a bright looking blue flower, growing close to the surface of the

ground, and indeed often half concealed by the coarser herbage which may exist about it: this is the *Polygala vulgaris*, or common Milk-wort. Upon closer examination it will be found to have much beauty of form and construction, and to be well calculated to repay a close investigation. We have often wondered how it is that this little plant has not been fostered by the cultivator; the beauties it displays in a state of nature strongly recommend it as suitable for rock work, where it would love to bask in the sunshine; and there can be no doubt that it would also admit of improvement under careful hands, just as the pansy and other flowers have been changed for the better, so far as attractiveness and display are concerned. Already, in its wild state, it manifests the elements of change; there are many variations to be met with in the uncultivated Milk-wort, chiefly, it is true, in the colour of the blossoms, but in some instances in their size also. It is in this latter direction that improvement should be sought, and we should be indeed glad to hear that some one had undertaken the task. It may be, perhaps, urged against this "wild weed" that many flowers now in our gardens exceed it in beauty. True; but why should our garden beauties be restricted within the narrow limits we at present find them? Why should not other plants be added to our domestic circles, if we may use the expression? The flowers of our own country vie with those of other countries in respect to variety and elegance of form, ay, and often in brilliant colours also; but in many instances they want size. This is just what cultivation can most easily impart to them; and it is to be done in this way:—Select the best wild form of the plant, and grow it under the most favourable circumstances, but not too luxuriantly. Allow but a few blossoms to open, and from these save seeds. Sow every seed, and preserve every plant till it blooms; it is ten to one that some difference will be observable in the quality of the flowers—some will have larger flowers than others. As soon as this quality is observed, suffer not the plants to bear many flowers, and save the seeds again from those which are allowed to open. Destroy all the other and inferior plants. As before, sow every seed, and see the blossoms of every one of the seedlings. A still further increase of size will most probably be detected in some of this set of plants, but if not, "perseverance" must be called in to the exile of "discouragement," and the improver must try again. It is just in this way that all other changes in the qualities and characters of plants have been effected; and it must be so again if any other examples of improvement are to be produced. The plants must, in all cases, be

moderately well grown, so that they may be able to develop whatever characters they may possess; and whenever an improvement is perceived, but a very few flowers should be allowed to open on that plant, the energies of the plant being rather directed to the perfecting of a few seeds than to the production of many flowers. Every seed must be sown, and every plant bloomed, because it is often observed that the weakest plants at the outset prove the best in the end, and the stronger plants often produce the very worst blossoms. How many years it would take to effect any material improvement is of course a problem, that experience only can solve; and there can be no doubt that some species of plants would be found much more susceptible of change than others, and these would, in consequence, be much sooner altered in accordance with any preconceived standard of excellence. We must now leave this subject in the hands of the experimentalist, and proceed to describe the plant as it is.

The *Polygala vulgaris* of Linnæus, or the common Milk-wort, is a dwarf herbaceous perennial, of a dark shining green colour, and growing from three to six inches high. The root is slender, tough, and woody, and from its crown are produced several procumbent stems, the points of which are more or less inclined upwards; these stems are somewhat angular and unbranched, and covered rather thickly with leaves, especially on the lower part. The leaves are fixed on all sides of the stem, and have scarcely any stalk; the lower ones are broadest, but also smaller, shorter, and more crowded than the rest; they are of an oblong figure; the upper ones are of a narrow lance-shaped figure, and are more thinly seated on the branches. The flowers are produced in racemes, one of which is produced at the end of nearly every stem; they are of singular shape, the flowers looking not unlike a bird with expanded wings; these wings consist of the two inner of five sepals, and, being large and coloured, they form the most conspicuous part of the flower. In this species they are obovate, with a point; the petals are small and narrow, from three to five in number, the lowermost one being shaped like the keel of a boat, and terminated by a crest-like fringe. The flowers are usually of a pretty deep blue, with more or less of white in the centre; sometimes they are of a paler blue colour; and not unfrequently plants are met with having white, and also having flesh-coloured blossoms. The blooming season is chiefly during the months of May, June, and July. The peculiar characteristic which distinguishes this species from *P. calcarea*, also found in Britain, is, that in this the lateral nerves or veins of the calyx wings

are branched and anastomose, or become joined with an oblique branch of the central nerve, but never join again directly with the central nerve itself, as is the case in the allied species just named. The calyx is permanent, becoming green after the flowers have passed their perfect state, the wings closing over and protecting the compressed heart-shaped seed-pod. A variety, to which the name of *oxyptera* has been applied, has the wings of the calyx narrower than in the species; and in this, too, the flowers and seed-pods are produced only on one side of the stem. The species is found throughout Europe, and is very common in Britain, growing chiefly in gravelly and heathy pastures.

The plant has a bitter taste, and has been sometimes used medicinally, in the same way as the Rattle-snake root (*Polygala Senega*) of North America. Lightfoot, in his *Flora Scotica*, says it purges without danger, and is also emetic and diuretic, sometimes acting in the three different ways together; he describes it as being used in the form of a decoction, made by boiling an ounce of the herb in a pint of water till it is reduced to half a pint; a spoonful is given. Dr. Withering states that an infusion of the herb taken in the morning fasting, about a quarter of a pint daily, promotes expectoration, and is good for a catarrhus cough. Cows, goats, and sheep eat it; swine refuse it. It is difficult to imagine how this plant acquired the name of Milk-wort, which name has been given also to other plants, which have greater claims to be regarded as favourable food for cows.

When cultivation is to be attempted the plant may be taken up whilst in flower—for a person unacquainted with it would not readily

detect it at any other time—and removed to the garden. It should be dug up with a considerable mass of soil, so as not to disturb the roots, and should be planted in a compost, consisting chiefly of sandy heath-soil. It might be planted on rock-work, where its little trailing stems would be properly associated; or it might be placed along the margin of beds of peat-earth shrubs, in those parts most exposed to view; or, if required, the plants might be potted, and would form very pretty objects in a collection of potted Alpine plants. To whatever situation it may be removed, however, if transplanted at the period of its flowering in May or June, it must not only be well watered, but pretty closely shaded for a week or ten days during sunshine, the covering being of course removed at night, and during cloudy weather. If the plants are taken just as they are coming into flower, and are carefully removed, they will not sustain any check, but will go on blooming for a considerable period: if otherwise, the plants themselves will merely be secured for blooming under artificial management the following season. When the blooming is over, the stems should be cut back nearly to the base, and the young shoots, which are to form the flowering stems of the following year, will be formed. From this time they need no more than ordinary routine attention: if planted out, nothing; if in pots, mere regular watering. When any attempt at improvement is to be made, the seeds of the best varieties should be carefully preserved, and sown in sandy peat soil as soon as they are ripe; the young plants should bloom in the following spring, and their seeds carefully collected, and sown as before.

ON THE GROWING OF SPECIMEN PLANTS.

BY GEORGE GLENNY.

SOME of the gardeners who have been held up as patterns of skill have been as sadly wanting in taste as their admirers, and one of the most easy things to accomplish in the whole routine of a gardener's duty has been extolled as proof of consummate mastership of the profession. Although we have undoubtedly seen many noble specimens of rare plants at the various Horticultural Shows, we have also seen many which betrayed great absence of knowledge of what a plant should be, and excessively vulgar notions of beauty. We need hardly say that whatever a plant may be in its nature, mere size will not go for any thing unless there is also handsome growth; the coarse and uncultivated idea, that he who can grow a plant fastest is the most clever, obtains only among persons who are strangers to elegance, to neatness, and to symmetry; yet how many have been held up to

their brethren as examples to follow, only because they have chanced to exhibit a monstrous pine, or enormous specimens of some popular plant! The skilful gardener will study the character of the plant, the nature of the foliage, the disposition of the flowers, and the most ordinary form in which it naturally grows; and this will determine him whether he shall encourage slow growth or rapid growth, whether he shall allow it to go its own way or be checked, and whether his artificial treatment will so change its ordinary nature as to require at the same time some artificial check. To commence with a very popular, and except for the numerous worthless and weedy varieties recommended by the papers, one of the most elegant plants—the Fuchsia. Let any one of our readers contemplate for a moment the great gawky specimens which have appeared at every show, with long-

jointed wood, badly furnished with leaves, and not much better garnished with flowers, and may they not say, with great truth, they have seen much better, much handsomer, though smaller plants, in private gardens of no pretensions, and also at market? In no one instance has it been our good fortune to see good specimens among the successful exhibitors at shows. We do not deny that there have been very large ones which have been grown in a very short time, but there is no merit in this. A cutting of the spring can, with the greatest ease, and without the one-shift system, be grown from six to ten feet high in a few weeks. There is not so much art in doing it as there is in producing a good cauliflower, or a respectable head of celery; but the gardener who attempts to hasten the growth of a Fuchsia does not know his business, or he is void of taste. The Fuchsia should be bushy and pyramidal to be really elegant, and this is impossible with rapid growth. We care nothing about stopping the branches; this may throw out laterals, but the more rapid the growth the more distant the leaves, and no amount of stopping can make it rich in foliage. The Fuchsia should not be grown in too exciting a soil, if beauty of form and richness of foliage be objects to be attained. The plant from a cutting should be grown without fire-heat, should never be shifted from one pot to another without first reaching the side with its roots; and the shift from one size to another should be merely the sizes the pots run, from sixties to forty-eights, then necessarily to thirty-twos, twenty-fours, sixteens, twelves, eights, and so on, depending entirely upon the size to which it is intended to grow it. Instead of bare long-jointed wood this will give well-furnished and short-jointed stems and branches; and as the bloom of a Fuchsia depends entirely on the habit of the plant, and cannot come anywhere but at the base of the leaves and ends of branches, it follows that the closer the leaves are the closer the bloom will be, and the more perfect the plant as a subject in flower. The plant that in strong soil and artificial heat will grow the leaves two inches apart, will, without heat and with plenty of air and moderate soil, grow them but an inch apart, and therefore instead of being clumsy and half naked, it comes elegant, and richly clothed both with foliage and flower. We need only call to mind the specimens shown at Chiswick by a public writer on the growth of the Fuchsia, and which were without one single claim except that of having an immense quantity of bare wood, few leaves, and fewer flowers. Others exhibited the same day pretended to have some claim for being the production of cuttings struck the same season, and grown as ugly as they were

grown rapid. Such, however, is the perverted taste of many, that this was considered a proof of skill by a number of persons—so much the worse, for the garden visitants knew no better. Let us take another plant, which we scarcely ever saw decently grown—the *Hovea* Celsi, and others of the same habit. Everybody grows it in too rich a soil: everybody grows it too fast, and exhibits bare stems where they should be well furnished, and tall gawky things where they should be moderately dwarf and elegant. We visited a nursery in the eastern part of the metropolis, at which there were unquestionably some of the first specimens in the world, of particular plants. The *Hovea* was an exception. Why? Because they were in exciting soil, in which they grow too rapidly, and run away too fast for anything. Checking is of no use in such a case. If the joints are too long, all the topping, all the forcing for lateral shoots, goes for nothing. The lateral, or side-shoots, grow as fast as the others did, make joints as long as the others did; and nobody can remedy the defect except by growing it slower, by abstaining from the exercise of that proof of skill which has been ignorantly proclaimed as the pattern for younger gardeners. Such is the habit of the *Hovea* that it cannot be grown too slowly; there must, to succeed, be a total absence of all exciting means—no artificial heat, no dung, no exciting manure in dressing; the compost cannot be too simple. Undunged loam, peat, and sand will produce the *Hovea* better than any other compost; plenty of air, great care in the watering at proper times, shifts from the smallest pots, only one size at a time; they will not bear the least excitement without being the worse for it, but they must be constantly attended, for if they really wanted for water but a few hours they would lose leaves and branches. They are better grown in a cold pit than in a greenhouse, if they are but safely covered from frost. But no; the patterns of skill show us large plants, which they boast they have produced from a cutting in a few months, whereas the true skill of the gardener would be best exhibited in the smallest healthy specimen they could produce of the greatest age. There is nothing unsightly in a plant of *Hovea* allowed to grow its own natural way, without any stopping of the shoots, provided it be grown slowly; but when grown fast all the stopping you can give them will not make them handsome nor prolific of bloom, although it may multiply the laterals and shorten the plant. The *Hovea* is as delicate in some respects as the most delicate *Heath*, and as soon loses its leaves if allowed to get dry, or to have sudden changes of temperature.—This brings us to the *Erica*, as another tribe that is often sadly misused to show off the

skill, as it is called, of a gardener. If the *Erica* be not excited into quick growth, it will be far more elegant, far more bushy, and be far better furnished than many of those large plants which have assisted to elevate a man above his right position. How many noble specimens do we see unfurnished at bottom? *Vestita alba* and *rosea*, grand though they be, with their branches naked half way up? The growers have been in too great a hurry; they have excited the plant; it has received a check, and lost some of its lower leaves,—but a few perhaps, but still some; and every time it has been excited and checked it has lost a few more; but heath growing, like all other specimen growing, has been sadly misunderstood by those who were in a hurry for large plants, and still more so by those writers who have exalted the skill, and measured it by feet and inches instead of by the taste and judgment displayed. The Heath cannot be grown too evenly; like the *Hovea*, it is impatient of artificial heat, and those who remember that the fibres of the root are next the side of the pot, should know that it is equally impatient of dryness. With the pots in the sun it is almost impossible to preserve moisture always, and therefore they ought not to be in the sun; and the poorneess of the soil in which they ought to be grown renders constant moisture indispensable, not absolute wetness but moisture,—plenty of air, as little in extreme as to temperature as possible, and for this purpose shaded from the mid-day sun. Few plants, however, attain any large size without having suffered many times from some neglect or other, and the more they have been excited the more fatal do these trifling neglects prove. If the plants lose but a few of their oldest leaves every time, we need not wonder at repeated neglects making the lowest end of their branches bare, or the leaves discoloured. There is as much difference in the growth of plants apparently healthy, as in the growth of cattle. Take a plant that looks as well without leaves as with them—the *Euphorbia splendens*—all thorns and brown stem, a few leaves at the ends of the branches and the growing points perhaps, and no more, but if well grown and not excited, furnished all over with abundance of its rich crimson-scarlet flowers. In one specimen, which shall be not excited too much, the branches shall be numerous, the joints short; in another that has been skilfully (as our theorists call it) grown, that is to say, grown in half the time, the branches shall be far apart, the joints long, even the thorns shall be quite twice the distance from each other, and consequently not half the quantity of flowers. In the trade, who desire to sell the largest plants they can produce as quick as they can

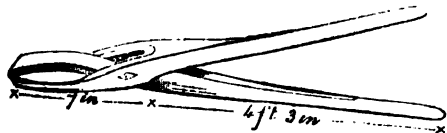
produce them, all this may be very well; they measure things as drapers do, by the yard, and simpletons order them. See in a nursery stock advertised—*Azalea indica*, twelve to eighteen inches, so much; *Boronia serrulata*, six to twelve inches, so much; *Correa bicolor*, twelve inches, so much. Then out of doors, *Daphne Bourbon*, twelve inches, so much; ditto two feet, so much; and so on, just as if the value of a plant went by inches and feet, when it is a well known fact that laurels, hollies, American plants, and other subjects grown rapidly, are not worth so much a yard high as they are, where they advance moderately, at half the height. Nor do blooming plants furnish so much nor such good bloom. We know this doctrine is unpopular. So was our denouncement of the one-shift system, but it was not less correct; and those who believed us, have to thank us for the preservation of their collection, while those who did not believe us paid dearly for their unbelief. We now denounce as bad gardening, and as the easiest, and therefore popular among the idle—the easiest gardening, the fashion of growing plants too fast. In the first place, it leaves a man at liberty to apply heat without any rule, soil without any consideration, so that a compost is rich enough; never mind its being, for some things, a little too rich; keep the house up to a certain temperature; never mind twenty degrees; more rich earth, heat, and moisture will set anything growing three or four times as fast as it would in a proper temperature. It is like feeding an animal enough, never mind its eating too much; as far as size goes we know all will be right, but how about symmetry? We must not particularize, because we would not be personal, but there is occasionally a much better grower of specimens than many others exhibiting at the great shows—specimens that may be seen to have been grown naturally, and tended carefully. Let our readers, and particularly those who do not quite believe all we say about rapid growing, look well among the plants at the Regent's Park and Chiswick for contrasts such as we have mentioned. Let them particularly examine the *Ixoras*, some with their leaves far apart, others very differently clothed. Let them particularly observe what a difference in the appearance for the better and worse. In one the red stems may be seen all over, because they are very little covered with leaves, that is to say, there is a great distance from leaf to leaf: then observe others, if there should be any, that do not exhibit the stem at all, but are well furnished. The one that is half bare is what some of the would-be teachers of the present day would call "skilfully" grown, the other has been "properly" grown. There is a wide dif-

ference between the value of such plants ; one that is a foot high is worth twice as much as the other at two feet. But it is time we left the subject, for it is sickening to even contemplate. It is gardening run mad. The men who figured most in the growing of plants fast, and who, being praised for their skill, soon put forward their notions on such points as were not under the control of practical men, did an infinity of mischief to plants, to gardeners, and to all the garden interests. The injudicious plan of awarding prizes at shows for plants thus spoiled added to the evils we complain of, and we are only now making our way against the popular and lazy system which had the support of theorists, and led hundreds into false notions of what constituted good gardening. It is not in producing ugly monsters that a man shines : it is not in showing plants in an unnatural form that a man exhibits his skill ; and nothing but a judicious appreciation of beauty, instead of size ; grace, and elegance, instead of feet and inches, by the judges at shows, will cure it. This cannot be expected while persons are selected who have risen from the ranks of the vulgar, with all their vulgar prejudices about them ; men who have only held their places by the encouragement of those who fancy they have achieved something out of the common way when they have produced a plant six feet high, while a good gardener, a man who cultivated upon true, practical, and scientific principles, would only have grown it half the height. This condemnation of rapid growing is not new with us : we condemned when the wisacres of Horticulture thought it was right ; we combated the champions of the one-shift system, and of Fuchsia-growing in a hurry, while a public writer was giving every encouragement to the practice, and defending it as a grand discovery in the science of gardening. We have seen our lessons operate among a few sensible men, and we shall now see it universally condemned. As in the case of showing Pelargoniums with a hundred sticks to hold up their miserably drawn stems, we shall see the very defenders of the discreditable offspring of ignorance and vulgar taste turn round and condemn it. We trust those who have respect for the true and proper habit of a plant, a love for symmetry, and grace, and elegance, will not fail to remember that slow growth, so that it be equal, and not occasioned by constant checks, produces short joints, close foliage, and abundant flowers ; and that great excitement and rapid growth, though much easier to be accomplished by a lazy gardener, produces the gawky things which it has been the fashion to encourage by prizes and to bespatter with praise in the public journals.

FRENCH WEED-PINCERS.

WE have recently met with a description of an implement employed for the purpose of extirpating tap-rooted and other weeds, tenacious of the soil, of which it may be useful to give some account. Those who have lawns, are constantly liable to annoyance from daisies, and sometimes dandelions, which although beautiful enough, and much to be admired in themselves, yet do not prove desirable additions to the "velvet carpet" surface of a well kept English lawn. Those who have paddocks, or parks, or meadows, or fields, either one or the other, are more or less liable to annoyance from such weeds as docks, thistles, coltsfoot, and similar perennial and difficultly-extirminated plants, which are either useless or detrimental in the positions they not unfrequently take up, and often maintain them with considerable success. The implement usually employed in this country, for the purpose of rooting out these, and such like pests, is called a weeding spud, and is made more or less light or bulky, to suit garden or field purposes. This consists of a narrow spud with two prongs about six inches long, and diverging somewhat less than a much compressed capital V ; a projecting bar on either side serves as a tread, by which the instrument is pressed in by the foot, just behind each weed ; a very broad bow behind rests on the surface, and acts as the fulcrum ; to these parts is added a handle like that of a spade. In this way the weeds are dug up, but it is obvious that in doing this, the surface must be more or less broken, a circumstance which, if not important on the farm, becomes so in the pleasure-ground. The French weed-pincer does not appear to have this disadvantage. The following quotation and figure from a recent work*, will make it sufficiently understood :—

"These were weed-pincers of very simple construction, which did their work of thorough extirpation in most creditable style. About five or six old women armed with this instrument, can clear a foul acre in an incredibly short space of time, and with hardly more bending of the body than a housemaid displays while sweeping a carpet. I saw them extracting thistles with roots of goodly length. Here is the tool : it is of deal ; one handle (the flat-



sided one) moves in the other, which is rounded :

* The Parson, Pen, and Pencil, by G. M. Mugrave, M. A., vicar of Borden, Kent. London : Bentley.

the 'grip' ends of it are notched. On application—to the thistle, for instance—the weeder, emulating the dentist, gets a good hold of so much of the root, as on pressure of the tool to the surface of the ground can be grasped; one smart tug, and up comes the mischief, 'fangs and all.' The cost of construction is fifteenpence."

It will be seen, that the implement is cheap and simple; and we think, it appears to be also efficient. Its use in weeding lawns would certainly avoid that breaking up of the surface which is one of the greatest objections to the weeding-spud. It would be proper to bear in mind, in using it, that in all cases, weeds may be removed from the ground much more easily after rain, than when it is at all parched for want of moisture.

CURTIS'S BOTANICAL MAGAZINE.*

THIS interesting work has for sixty years presented the public with portraits of the leading botanical beauties that found their way into English collections, and maintained its popularity in spite of a formidable rival, which had its day under the superintendence of, among others, Dr. Lindley, and therefore commanded, or ought to have commanded, early sketches of all the novelties introduced by the Horticultural Society. Two or three years since, the *Botanical Magazine* passed from the hands of the Curtis family, who were by no means supported as they deserved, to the management of others, and has for that period, under the able editorship of Sir W. Hooker, and the liberal expenditure of the proprietors, risen higher than ever it was in public estimation; while the *Botanical Register* has been quietly withdrawn from circulation, and left Sir W. Hooker's work alone in the literary world. It would be altogether superfluous to say anything here about the accuracy of the learned editor's descriptions, or the correctness of his views; the letter-press which he furnishes is, as everybody who knows the extent of his attainments would expect, complete; and the execution of the various portraits of plants and flowers is faultless; the plates give us a proper notion of the plants they profess to represent. There is no concealment of habit by giving us too little, no flattery by giving us too much. The colouring, the texture, the structure of the subjects, are well represented; and they cannot but be well chosen, for they are chiefly the latest novelties of the horticultural and botanical world, and subjects which, if old, have been rarely flowered. The botanist and the plantsman cannot know what is doing in the

horticultural world without this work; every month gives him the particulars of some novelties, and to miss it but for a number or two, is to lose sight of the progress of the science for the time being. Sir W. Hooker, by his situation as director of the first establishment in the world, has the best opportunities of seeing what is publicly introduced for the national garden; and his position as a gentleman and a botanist, secures the earliest account and the first sight of whatever anybody may produce or obtain by other means. The work, therefore, may be looked upon as the only means of publishing to the horticultural world the things that interest the cultivators of choice collections. We have frequently, in our endeavours to impart novelty, availed ourselves of the portraits of flowers in this work, not to imitate their delicate colours, or to aim at their size and effect, but to give some faint idea of the things we have been describing, and explain with a very humble sketch from Dr. Hooker's portraits, somewhat clearer than we could do by words only, the nature and form of an occasional novel plant or flower.

The *Magazine*, which was always good, is still greatly improved in the new series. And we would suggest this epoch as a desirable opportunity for the commencement of a work which is essential to every lover of flowers, and without which no library of any pretensions can be complete. To those whose object is a selection of rarities, rather than a large collection of plants, *Curtis's Magazine* is indispensable; in proof of which, we merely give a list of the new plants whose first portraits have been published in the few volumes of the present series.

1845. *Luculia Pinciana*. *Ruellia lilacina*. *Gesnera Schiedeana*. *Whitfieldia lateritia*. *Salpicantha coccinea*. *Angræcum apiculatum*. *Eria Dillwynii*. *Sida pæonæiflora*. *Begonia albo-coccinea*. *Achimenes argyrostigma*. *Porphyrocoma lanceolata*. *Siphocampylus coccineus*. *Anigozanthus pulcherrimus*. *Echinocactus multiflorus*. *Chirita Zeylanica*. *Echinocactus Leeanus*. *Gardenia Stanleyana*. *Lycaste fulvescens*. *Genista Spachiana*. *Rhynoglossum vespertianum*. *Evolvulus purpureo-cœruleus*. *Ixora odorata*.

1846. *Gloxinia pallidiflora*. *Mormodes Cartoni*. *Eranthemum albiflorum*. *Maxillaria macrobulbon*. *Torenia edentula*. *Ægiphila grandiflora*. *Fuchsia macrantha*. *Gesnera bulbosa lateritia*. *Puya Altensteinii* (as *Pitcarnia undulatifolia*). *Gesnera elliptica*. *Tropæolum crenatiflorum*. *Alloplectus repens*. *Datura cornigera*. *Diastema ochroleuca*. *Clerodendron sinuatum*. *Leschenaultia splendens*. *Æschynanthus Lobbianus*. *Stenocarpus Cunninghamii*. *Odontoglossum hastilabium*.

1847. The volume for 1847 opens with four

* *Curtis's Botanical Magazine*, &c. &c. By Sir W. J. Hooker, K.H., D.O.L. Oxon, &c. London: Beeve, Benham, & Reeve, King William Street, Strand.

beautiful plates, representing the splendid *Victoria Regia*, or *Victoria water-lily*. *Cor-dyline Rumphii*. *Begonia fuchsioides*. *Niphaea albo-lineata*. *Smithia purpurea*. *Siphocampylos microstoma*. *Anigozanthus fuliginosa*. *Æchmea discolor*. *Columnnea aureo-nitens*. *Ruellia Purdieana*. *Marsdenia maculata*. *Thibaudia pulcherrima*. *Gardenia malleifera*. *Puya Altensteinii major*. *Hypocyrtia leucostoma*. *Achimenes cupreata*. *Pentstemon Gordonii*. *Æschynanthus speciosus*. *Ixora Griffithii*. *Echinocactus cinnabarinus*. *Columnnea crassifolia*. *Siphocampylos glandulosa*. *Tritonia aurea*. *Tropæolum umbellatum*. *Browallia speciosa*. *Gesnera triflora*. *Gardenia nitida*.

VEGETATION OF BORNEO.*

THE journey of Mr. Hugh Low, the son of the respected nurseryman of the same name, at Clapton, was as interesting to the botanical and horticultural community as any adventure of the last century, as being an entirely new field for the gathering of a botanical harvest. The volume opens with a memoir of Mr. Brooke, who has performed in Borneo miracles in the way of reforming the people, and is, in fact, the ruling power in that locality. Mr. Low's residence with that gentleman, as Colonial Secretary, gave him every facility for seeing the country, and he has made the best use of his opportunities. The work is valuable as the natural history of Borneo, or rather, of the parts visited, and the portions devoted to the plants of that locality are exceedingly interesting; for instance, there is no slight novelty in *Rhododendrons* assuming all the features of epiphytes, and growing on the stumps or branches of other trees, yet this is only one of a hundred novelties equally interesting. The volume, however, must be read to be appreciated, and the following extracts will be the best evidence of its general character:—

"The celebrated upas tree, *Antiaris toxicaria*, is found upon the island, but not very common. Of a tree which I had an opportunity of observing, through the kindness of Captain Bethune, R.N., C.B., who allowed me to accompany him to Borneo, in May, 1845, and gave me every facility for examining the jungles which the disturbed state of the country would admit, and which were in his power, many absurd stories were related to me by the natives, similar to those published by Mr. Foersch, of the Dutch East India Company, in the 'London Magazine' for September,

1785; and it seems very curious that, having this tree before them, which was surrounded by their graves, they should tell me it was impossible to go under it without dying.

"On my insisting, however, I got one of them to climb up to get me some specimens, but they were neither in flower nor fruit. The poisonous sap flows freely from the bark when tapped, and Dr. Horsfield, whose admirable account of it was first published in the *Batavian Transactions* (vol. vii.) and afterwards by Sir Stamford Raffles, (*Hist. Arch.* vol. i.) tells us that it is equal in potency, when thrown into the circulation, to any animal poison yet known. Several interesting experiments with it, in prepared and natural states, are detailed in the paper alluded to. The tree is called 'Bina' by the Borneans, and has a fine appearance. The specimen at Borneo was about sixty feet high, with a fine stem, the bark of which was of a very white colour: it was supported at its base by those processes resembling buttresses, which are so common to the trees of tropical jungles.

"A poison of greater potency was said to be manufactured from a climbing plant which grew in the neighbourhood of Bintulu: it is perhaps the same as the 'chitik' of Java—the botanical name of which is not yet ascertained. This was called upas by the natives of Borneo, but I think, with other authors, that upas is a name for vegetable poisons in general.

"Dammar is a resinous gum produced by many kinds of trees quite different in their character and habit from the *Dammara orientalis* figured in Marsden's 'History of Sumatra.' The dammar is of several kinds: the white, which is used for the same purposes as gum copal, is called 'dammar mata kuching,' or the cat's-eye dammar; it is the least common, and most valuable, being beautifully transparent. The 'dammar daging,' or flesh-like dammar, takes its name from its veined appearance, which causes it to resemble some kinds of agate; it is not set apart, but used with the common kinds for paying the seams of boats and prows; for which purpose it is pounded and boiled with wood oil until it becomes of a pitchy consistence.

"The various kinds of dammar form an article of considerable trade between different places in the Archipelago, and are exported to India and China from Singapore, at a very low price: they exude spontaneously, and are collected after having fallen to the ground. The Dyaks and Malays form torches of this inflammable substance, by filling the interior of small bamboo canes with it, which have been previously dried for the purpose; such torches are used only by the poorer classes of Malays, those in better circumstances preferring the more expensive oil of the cocoa-

* "Sarawak; its Inhabitants and Productions: being Notes during a Residence in that Country with His Excellency Mr. Brooke. By Hugh Low, Colonial Secretary at Labuan. London: Bentley. 1848."

nut, which is burnt in tumblers by means of cotton wicks generally floating in the oil.

"The 'kulit lawang' of commerce is the aromatic bark of a wild species of cinnamon, and is produced in abundance in all parts of the island: it is the true *Cinnamomeum kulit lawan*, but I think that other varieties are also found. It was probably this plant which induced the earlier voyagers to imagine that the true cinnamon of Ceylon, which this much resembles, was found in the Archipelago. The bark is well known for its clove-like aromatic flavour, and for the essential oil it produces, which, however, is never extracted by the natives of Borneo.

"Cotton is grown by the Sea Dyaks sufficient in quantity for their own use, and to make cloths for exportation. Some of the same kind produced in the garden of Mr. Hentig, and which was sent to Liverpool as a sample, was found to be of superior quality. Its cultivation will hereafter, probably, form an important feature in the agricultural pursuits of the island, as it can be exported to China with great advantage. Indigo has not been tried on the island; but as it succeeds in Sumatra and Java, there can be no doubt that its culture might be successfully pursued.

"Pepper has been long exported in great quantities from several ports in Borneo, particularly from Bruni and Banjar. During the disturbances of Bruni, since the withdrawal of the English factory, the trade has very much declined, as the Chinese—who, it is said, to the number of 30,000, cultivated pepper in the neighbourhood of the capital—have all been obliged to leave, neither their lives nor property being secure; the few who are now in Bruni, and who do not probably exceed twenty in number, being detained as slaves. The pepper at present exported from Bruni is grown by the Kadyans and Meroots, a race of people resembling the Dyaks, who inhabit the interior of the Borneo river. It is a curious fact, remarked by all writers on the East, that this aromatic is universally esteemed, except by the inhabitants of the countries which produce it; the Malays never use it in their cookery, as they ascribe a heating quality to it: the small kind of capsicums they use largely, and attribute to them a contrary effect. In 1801 the district of Banjarmasin alone, on the south coast of Borneo, was capable of producing 1,500 tons of this spice.

"Coffee has been tried in the gardens of the Europeans, and thrives remarkably well, producing a fine and well-flavoured berry. I have been told by the Malays that it is grown by the Dyaks of the Pontianak river, for the use of that settlement, but its cultivation on an extensive scale has not been encour-

aged; the government probably not wishing it to come in competition with Java, which so largely produces this berry. The hills on the main-land opposite Labuh-an, would be well adapted for its cultivation, since here, as in Ceylon, it might be grown without the trouble and expense of raising trees amongst the plantations to protect the bushes from the sun, as is done in Java. In Ceylon the best elevation for the coffee estates is from 3,000 to 4,000 feet; the berries produced at this height being of much finer quality and richer flavour than any others.

"Gambier (*Uncaria*) is not cultivated in the island, though found wild in many parts of it: that used by the Malays is brought from Singapore, the Dyaks contenting themselves with chewing the leaves together with their Sirih, &c. The gambier plantations in Singapore are said so much to exhaust the land, that nothing can be grown on their site for many years after they are abandoned.

"Tobacco is grown in small quantities by the Dyaks and people of Bruni; but they are unskilful in its manufacture, though the flavour of that of Bruni is much esteemed by Europeans. Under skilful management, and by introducing a better kind—if the one now known should not prove a good one—it might become as profitable to the island as it now is to the neighbouring ones of the Philippines, Java, and Bali. The Dyaks might be more readily induced to cultivate this plant, the nature of which they know, than indigo and other plants which are strange to them.

"Besides the articles above imperfectly enumerated, many others, it is highly probable, might be introduced with advantage. The success attending the partial cultivation of the spices of Amboyna, and the Banda islands, has been already mentioned, and it is probable that they may be cultivated at so cheap a rate, as to be able to compete with the productions of their native islands, even if all restrictions on the commerce in them were removed by the government. Vanilla, should the climate not prove too damp, is a valuable spice, and of easy cultivation. The cocoa-tree of Manilla (*Theobroma Cacao*) has been proved to be in every way suited to the soil and climate, producing fruit of excellent quality. Cotton, it has been already said, might be cultivated with advantage; as also the plantain, (*Musa textilis*), of which the fine Manilla cordage is made. Ginger grows well in all the native gardens, and turmeric is found wild in abundance. Many kinds of oils might be produced in perfection, and most of the valuable vegetable productions of India and the tropics, it is supposed, might be here successfully grown, and profitably exported. Now that the British settler will be cared for

and protected by his own government, the national enterprise will soon develop some of these immense vegetable resources.

"While treating of the vegetable productions, the many valuable kinds of wood produced by the vast and magnificent forests of the island must be noticed. The botanical characters of but few of these are yet ascertained, so that I am unable at present to furnish their scientific names. The wood most esteemed amongst the natives, on account of its hardness and durability, is called by them 'balean' or 'kyuh' balean,' the term kayu, meaning wood, being always appended to the names of timber trees.

"The balean is a tree of the largest size, and although its wood is so hard as to be almost incorruptible, the tree is of quick and vigorous growth: it is found most abundantly in the low damp forests in the neighbourhood of the sea and of large rivers. It is much used by the natives for posts of their houses, which, amongst the Dyaks, are handed down from father to son for many generations. Many specimens which I have seen, and which must have been in the river for ages, are as hard when cut as those fresh taken from the forest, and I have never met with a piece of this timber in a state of decay. The water-worm (*Teredo*) is the only insect which attacks it when in the water; and though its channeling the wood must necessarily much weaken the post, the water being admitted into it does not cause it to rot. On land or under the earth it equally resists the effects of atmosphere and white ants, so destructive in tropical countries to most other species of wood. This valuable timber was formerly an article of export much sought after by the Chinese; and in those ports which they still frequent, is still a source of considerable trade.

"Next in value is the 'kayu kapur,' a close-grained and durable timber, much valued by the natives for boat-building purposes. Several kinds of the puhn of India grow here in perfection; they are called by the natives 'bintañgur,' and are well known for their value in ship-building. The 'kayuh rasack' very much resembles the bintañgur, is close-grained, strong, and tough, and is used for rudders, masts, and oars for the trading boats. The mungris is, while fresh, nearly as hard as the iron-wood, and more difficult to be worked; though it is very durable, it is not equally so with the balean or iron-wood; but is a large timber and a very fine tree. The 'merbau' is a fine durable timber, very useful in ship and house building, being easily worked and very durable.

"'Mencabang pinang' is one of the trees which produce the vegetable tallow: it is plentiful in the forests, but would be more

profitable for its fruit (which is of the small kind, and produces good oil) than its timber, though for this it is also held in high esteem. The wood is close-grained, hard, of a reddish colour, easily worked, and very durable. This tree differs from the others which produce the vegetable oil, in growing to a much greater height. The timber of the Kapur barus, or true camphor tree, is also highly esteemed: excepting when charged with the valuable drug, it does not emit the camphor smell, as does the timber of the *Laurus camphora*, of which the Chinese manufacture trunks and boxes, which, from the odour emitted by the wood, preserve whatever is put into them from the attacks of insects of all kinds, particularly of the small ants, which are so troublesome in hot countries.

"The 'neri' is a very hard wood, growing with the mangrove in salt swamps; its timber, which has a reddish appearance, is not large, but very abundant. The 'jelutong' is a larger growing tree with verticillate leaves, and a bark which, on being wounded, emits plentifully a white milk, which is inspissated by boiling, but has not yet been discovered to be of any use. The timber it produces, though large, is not esteemed by the natives, on account of its early decay when exposed to the rain and sun: it is white, and, being very soft, easily worked; and it is much used by the poorer Malays for the sides of their houses, which are protected from the rain by the overhanging roofs. The 'maranti,' also a quick-growing timber tree, is held in much higher esteem than the last. In grain it resembles cedar, and like it is of a reddish colour, and it is much valued for making packing-cases, planks for the sides of houses, &c.; when protected from the weather it is a good and useful timber. The 'duñgun' also belongs to this class: it grows on the banks of rivers, and, though the timber is soft, the large buttress-like supports at the base of the tree are very hard, and are valuable for gun-carriages, and other purposes: they would doubtless be useful in turnery.

"These that I have enumerated are but a few of the trees in most general use among the natives; indeed, I have been informed that the trees which are abundant, and produce excellent timber, amount to upwards of sixty species: many of the other kinds, not useful as timber trees, are valuable, or might be, for making charcoal, potash, pearlash, &c. Several kinds of oaks are found in the forests, but being of quick growth and soft wood, their timber is not esteemed.

"Of ornamental woods, though it is improbable that the island should be destitute of them, many kinds have not yet been found. The ebony is abundant in many parts of the

island, particularly on the west coast, but it is said to be inferior to that from the Mauritius, although it has been found a very profitable export to China. In the neighbourhood of the Lundu river, in the Sarawak territory, are large forests of it, which the Sebooyoh Dyaks would collect with gladness, if merchants were established at Sarawak to buy it of them. The 'ruñgas' is a red wood handsomely veined, which takes a fine polish, and is much used at Singapore for the purposes of furniture-making: like the ebony, it is only the old wood in the centre of the tree which is of an useful colour.

"Of scented woods, several are known to exist, though few are collected, the value of the others not being yet known to commerce. The 'bidarru,' a yellow wood of a very agreeable odour, is the most plentiful, and being of a very hard and durable nature, is much esteemed for posts of houses and other purposes underground: its perfume will ultimately rescue this beautiful wood from its present degradation. There are one or two others, the names of which I have not preserved, which are all very durable and highly esteemed woods amongst the natives. The sandal wood, though it grows on Timor, has not, I believe, been hitherto found in this island.

"Lignum aloes, of which there are several kinds, called generically by the natives 'kayu garu,' are produced apparently by diseases in some trees, the scented and resinous parts not being procurable until the tree has been cut down and decayed. The garu has long been an article of considerable export from this and the other islands to Arabia and China, where it is burned as incense.

"A curious substance called 'plye' is collected in the forests, and is the root of a large timber tree of the same name. It is very light, more so than cork, and might perhaps be used for the same purposes. A very similar substance is the root of another tree called 'si pait,' or the bitter wood: to the taste it is, as its name implies, very bitter, and in substance, appearance, and lightness, precisely resembles its tasteless congener. These plants have never been as yet either commercially or botanically examined, so that their uses are at present unknown, but the bitter one may perhaps prove valuable as a medicinal drug. The timber of both these trees, though large, is white, light, and useless, resembling that of the jelutong already noticed.

"Dye stuffs and tannin are the produce of many barks and fruits of the Indian islands, but from what has been hitherto ascertained of them, they are not likely to be of use except for home consumption.

"The flowers of Borneo, and of the Archi-

pelago generally, are not less grateful and beautiful than the forests are grand and majestic. It has been said, perhaps too hastily, that no country in the world produces such ravishing vegetable perfumes as the Malayan islands; and the well known and now widely distributed scents of Kananga, (Uvaria,) Champaka, (Michelia,) Melur, (Jasminum,) and many others, would seem in a great measure to sustain them in this enviable pre-eminence; but though grateful perfumes are in such profusion, the woods also abound in shrubs and flowers, which delight the eye and attract the curiosity by their rich and gaudy colours, or their delicate and beautiful forms. As in all tropical countries, the tribe Orchidaceæ is in profusion and beauty; and on the open banks of the rivers, where the sun can shed its vivifying influence upon them, these delightful epiphytes decorate with their fragile but showy forms the otherwise naked and unsightly stumps of decaying forest trees.

"The most gaudy are perhaps the various species of *Cœlogyne*, called collectively by the natives the 'buñga kasih-an,' or the flowers of mercy; they are all highly fragrant, and their white and orange coloured flowers are exceedingly delicate and beautiful. Several *Vandas*, of which the continent of India has produced so many for the ornament of our gardens, are found here inferior to none of those from India, many of which are, by one gigantic species, far surpassed in beauty. This I have been successful in introducing into England, and Dr. Lindley has done me the honour of naming it after me.

"One kind of the beautiful genus *Cypripedium*, or Ladies' Slipper, so named from the curious form of the labellum, far surpasses in beauty any of its tribe from other countries. The *Dendrobiums*, which in India are so gorgeous, here dwindle, for the most part, into insignificant flowers; while the species of *Eria*, which are abundant, are so beautiful that, were they once seen, they would probably raise their hitherto despised genus in the estimation of the English cultivator of these beautiful plants. Of the smaller kinds, the *Cirrhopetalum*, *Bolbophyllum*, and some other genera, though not showy, are curious, delicate, and beautiful. Several new species and some genera I have had the pleasure of introducing into England.

"On the banks of the rivers, and growing as underwood in the dense jungles, are found many beautiful species of the genera *Ixora*, and *Pavetta*, the former with large bunches of flowers of every shade, from orange to crimson, the latter with tufts of pure and delicate white blossoms. Other genera of the order *Rubiaceæ* abound, and are amongst the

most beautiful wild plants; many of these are fragrant.

"Perhaps the most gorgeous of the native plants are the various species of the genus *Rhododendron*, which here assume a peculiar form, being found epiphytal upon the trunks of trees, as in the genera of the tribe *Orchidaceæ*. This habit, induced probably by the excessive moisture of the climate, is not, however, confined to the *Ericaceæ* plants, but also prevails with the genera *Fagraea*, *Combretum*, and many others, usually terrestrial. The roots of the *Rhododendrons*, instead of being, as with the species, inhabitants of cold climates, small and fibrous, become large and fleshy, winding round the trunks of the forest trees; the most beautiful one is that which I have named in compliment to Mr. Brooke. Its large heads of flowers are produced in the greatest abundance throughout the year: they much exceed in size that of any known species, frequently being formed of eighteen flowers, which are of all shades, from pale and rich yellow to a rich reddish salmon colour; in the sun, the flowers sparkle with a brilliancy resembling that of gold dust.

"Four other species which I discovered are very gorgeous, but of different colours, one being crimson and another red, and the third a rich tint between these two: of the fourth I have not yet seen the flowers. Besides the curious nature of the root above noticed, botanists may learn that these species differ from others of the genus in having very small, almost imperceptible, calyces, and caudal appendages to the seeds; these last greatly facilitating the attainment of a situation favourable for their growth. Four species of the *Clerodendron* also adorn the banks of the Sarawak river, two of them bearing white, one scarlet, and one crimson flowers; one of the white ones emits a grateful perfume.

"The *Clerodendron* which bears the crimson flowers is the most handsome of them all; it grows to a shrub of ten feet in height, having at the point of every branch a large loose spike of rich crimson flowers; the head of the flowers is frequently three feet in height from the foliage—rarely less than two—forming with the bracts and stems, which are equally crimson, a magnificent pyramid of flowers; each being relieved by a beautifully white centre and the long protruding stamens; the foliage is also fine, being heart-shaped, very large, and dense. This fine species, which is now growing well in England, I have named after Captain C. Drinkwater Bethune, R.N., C.B., whose kindness in Borneo was of the greatest assistance to me, and who, on his return, was successful in introducing some of the finest of the Borneo plants.

"When the *Clerodendron* has ceased flow-

ering, the crimson bracts and calyx which remain are scarcely less gaudy than the flowers, and each calyx contains within it a four-seeded berry of the richest blue colour. *Scitamineæ*, an order not much cultivated in England, produces some beautiful plants here of the genus *Alpinia*, and others. A fine white fringed-flowered *Bignonia* is a beautiful and fragrant shrub. An *Echites*, which produces its handsome blossoms abundantly in April and May, grows also on the banks of the rivers; it emits a delightful perfume. The beautiful *Melastomas* grow everywhere in open places, and their soft and pulpy fruit furnishes a never-failing supply of food to pigeons of every colour.

"Of climbing-plants, a new and undescribed species of *Bauhinia* is the most showy, covering the trees in December with its large bunches of gaudy crimson blossoms. The *Hoya imperialis* is highly beautiful, its large and rich purple flowers being relieved by the white, ivory-like centre; it is epiphytal. On trees near the river various kinds of beautiful *Combretums* may be added to these; and *Cyrtandraceæ* produces species of *Lysionotus* and *Æschynanthus*, which yield to none in beauty: that which bears the name of the Earl of Auckland, (*Lysionotus Aucklandii*), far surpasses any others yet known in the size and richness of colouring of the flowers, which are produced in bunches frequently containing twenty-four corollas; it is distinguished from others by its undulate and verticillate leaves, and the woody nature of the stems, which render it more a shrub than others of its genus.

"On the mountains are found plants altogether different from these: there the genus *Dacrydium*, and others of the order *Taxaceæ*, resemble the cypresses and firs of our northern clime. Herbaceous plants of great beauty are also found on the exposed and damp rocks, while in mossy places the beautiful golden-leaved *Anætochilus* and a new and more beautiful species flourish. But of all those above mentioned, though they excel in beauty, none so much attract our curiosity as the various and beautiful pitcher-plants, eight different species of which I discovered in the western part of the island.

"The pitchers, which in some instances would contain upwards of a pint of water, hang from the midrib of the leaf of which they are a formation; they precisely resemble pitchers, being furnished also with a lid. The *Nepenthes Rafflesiana* produces its pitchers singly; they are large and generally crimson: it grows on rocky islands in the neighbourhood of Singapore, and it is easily distinguished from its near ally the native of Borneo and Mount Ophir by its inferior size, shortness of the column which supports the lid, the

white and powdered appearance of its stems, and its bushy habit, never exceeding four or five feet in height; while the largest Bornean one, which I propose to call *Nepenthes Hookeriana*, in honour of Sir W. J. Hooker, the able director of the Botanic Gardens at Kew, is found growing in deep and shaded jungles, climbing to the tops of the trees. The pitcher is nine inches in length, having a large lid standing on a column, which is a continuation of the beautiful edge of the pitcher: that part which is broadest and turned towards the mid-rib of the leaf from which it depends, is furnished with two broad wings, which are beautifully ciliated with large ciliæ; the broad pitcher—for this, like the *Rafflesiana*, produces two kinds—is generally crimson; the long pitcher differs from the other in its trumpet shape and green colour, which is spotted with crimson. The flower I have not seen, but the leaves, which are moderately large and broad—at least those of them which produce the broad pitcher, and which are found near the base of the plant—are dark green above, and of a fine peach-coloured red beneath. Six plants of this kind are now in England, but have not yet produced their pitchers.

“The *Nepenthes ampullacea* produces its green or spotted short and broad pitchers in a different manner from the last: it is also a climbing plant, and found in thick jungles. The old stems, falling from the trees, become covered in a short time with leaves and vegetable matter, which form a coating of earth about them; they then throw out shoots which become in time new plants; but apparently the first attempts to form the leaf are futile, and become only pitchers, which, as the petioles are closely imbricated, form a dense mass, and frequently cover the ground as with a carpet of these curious formations. As it continues growing and endeavouring to become a plant, the laminæ of the leaves gradually appear, small at first, but every new one increasing in size, until finally the blades of the leaves are perfect, and the pitchers, which, as the leaves developed themselves, have become gradually smaller on each new leaf, finally disappear altogether when the plant climbs into the trees. This formation of the pitcher may afford an instructive lesson to the naturalist, as, though not to the same extent, the principle is perceptible in all of this curious tribe, the leaves of seedlings and weak plants always producing the largest pitchers.”—Pp. 52—69.

AN ABSTRACT OF REPORTS AND PROCEEDINGS OF THE HORTICULTURAL SOCIETY, WITH NOTES BY A PRACTICAL GARDENER.

THE MANAGEMENT OF FIG-TREES IN THE OPEN AIR.—Mr. Sawyer, the Gardener to

Lyon Goldsmid, Esq., in 1823, thus relates the particulars of his practice to the Horticultural Society:—In the beginning of November, I detach the whole of the branches from the walls, removing all the nails and shreds, after which I carefully examine the autumnal fruits, leaving on the branches all that have a firm skin and are of a dark green colour, and that do not exceed the common filbert in size. Those which are not of that description I remove. I then draw into a sort of cone as many of the branches as are contiguous to each other, and tie them together, filling all the vacant spaces between the branches in these cones, with short, dry, and clean hay, and roll double mats over the whole, being particularly careful to guard the extremity of the branches from the inclemency of the winter's frost. I then lower the whole of the cones either to the right or left, as may be convenient, in such a manner that the tops of each may be at least two feet below the top of the wall; they are then made fast to the wall with good ties of rope-yarn. I let them remain in this state until March, when I take off the mats, and remove the hay. Selecting the best placed and most productive branches, and taking out ill-placed, superfluous, and irregular ones, I train to the wall those which are preserved, in proper regularity and good order, according to their situation, but not nearer to each other than six or eight inches. After the whole tree has been nailed, I cover it with a single mat, which remains on until the middle of April, when it is taken off and a net three times folded put in its place. The net is taken away one fold at a time, according to the advance of the foliage and warmth of the weather, and the whole tree is cleared by the latter end of May. If I find during the summer that the leaves are so thick as to exclude the sun from the fruit, I take off a few of them with care, but not so as to admit much reflection from the wall, which would be injurious to the fruit. In removing the leaves I am always mindful to cut the foot-stalks directly under, or close to the leaf, that the coozing of the milk may soon dry up.

As it is very desirable to have a regular succession of figs from August to October inclusive, I cultivate the following sorts, which ripen in the order in which they are named.

- | | |
|--------------------------------------|----------------------------------|
| 1. Brown Ischia | ripens in the middle of August. |
| 2. Large White Genoa | ripens the end of August. |
| 3. Green Ischia | ripens the beginning of Sept. |
| 4. Murrey, or Brown Naples | ripens the middle of September. |
| 5. Ford's Seedling | ripens the end of September. |
| 6. Black Provence | ripens the beginning of October. |
| 7. Yellow Ischia | ripens the middle of October. |
| 8. Gentile | ripens the end of October. |

These are all good kinds: the Murrey, or Brown Naples, will ripen its fruit as a standard in fine summers, as will also the Blue

Ischia and Black Genoa, which are not enumerated in the above list, because they are not so certain bearers in all soils.

The Fig I have named Ford's Seedling, is sometimes called the Pockock Fig, and is, I understand, more properly denominated the White Marseilles Fig. The Black Provence Fig I originally found in the Garden at Bookham Grove, near Leatherhead, then belonging to the Honourable Marmaduke Darnley; it is of an oval shape, having a very dark brown skin, and with dark purple flesh; the plant grows vigorously, producing large leaves, and is a tolerably free bearer.

There is hardly a more luscious fruit than the fig, well ripened, in England, nor is there any thing much more easily cultivated: we have seen bushels on old walls at Hammer-smith, growing almost without an effort of the gardener, covered part of the time with old flags and ragged bunting. The trees seemed to stand the winter, and there was more fruit than was proper for the health of the trees, and one half of them in high perfection.

THE CULTIVATION OF CHINESE CHRYSANTHEMUMS IN THE GARDEN OF THE HORTICULTURAL SOCIETY. By DONALD MUNRO.

In the beginning of April, a certain number of cuttings of each sort of Chrysanthemum in the collection, are taken for the supply of flowering plants for the ensuing season. The cuttings are taken from the top shoots of the last year's plants. The pots used for the cuttings at first are those generally called about London, small sixties. They are filled with mould made up of one-half equal portions of loam and bog-mould, and one-half sand. The cuttings when prepared, are about three inches long; they are inserted singly, one in each, and when all are potted, the pots are placed in a frame supplied with a gentle bottom heat. They are kept in the frame until they are well rooted, which usually is in about three weeks or a month. When the plants are fit to move, they are placed in a cold frame to harden a little before they are exposed in the open air; for this it is necessary to take off the lights in the day-time, and to close them again at night. About the beginning of June, the plants are shifted into forty-eight sized pots; they are then arranged in an open airy piece of ground, and watered with richly manured water, in which soap-suds has been mixed. The pots are never plunged in the earth, as it is found they do equally well without it, and when they are plunged in garden mould, the plants are continually rooting through their pots, and require to be moved every week or fortnight; besides, the quantity of mould in the pots is so small that it requires frequent watering, and when the pots are plunged watering is

often neglected, and the consequence is that the shoots grow weak and small. After the second potting, the tops of all the plants are nipped off to make them bushy, and when they put out fresh side shoots, no more of these are allowed to remain for flowering than the plants are likely to be able to support. In the month of August, the whole are shifted into thirty-two sized pots, which are afterwards arranged in an open airy situation as before, at such distances as to allow the plants plenty of room to grow without touching each other's leaves. Here it is necessary that they should be frequently moved, in order to prevent the roots growing through the pots into the earth. It is also requisite that the plants be now tied up to sticks. The compost used in the last potting is strong loam, with about one-third of rotten dung. The pots are not taken under glass until they have formed their flower-buds, and even until some of the earlier sorts are beginning to expand their flowers. In setting the plants in a glass-house, for show, it is necessary to mix the varieties as much as possible. In the Garden of the Horticultural Society, the plants have been placed in a small curvilinear house fifty feet long, which holds about seven hundred pots at one time, there being no other plants but Chrysanthemums put into it at their flowering season; and at a moderate calculation, that quantity exhibited in the past season ten thousand flowers expanded at once. Some of the large plants which flowered the preceding season, of which a few are always kept over, produced about sixty or seventy flowers each.

After all the cuttings that are wanted are taken from the old plants, they are turned out of their pots, the old mould is entirely taken away from their roots, and the suckers are rubbed off; they are then potted in forty-eight sized pots, and when they have filled those with roots, they are shifted into thirty-twos. In the month of August they are either put into twenty-four or sixteen sized pots, according to their size and vigour. They are generally kept with one stem, but sometimes three or four stems are allowed to rise; each of these is trained to a stick, and when the collection is taken into the house for flowering, the large plants are placed behind the small ones; thus the size of their pots and the length of their stems are concealed from the view, whilst their superior height forms a good back to the whole mass of plants. It is to be observed, that the whole collection is not taken into the house at first; the late flowering sorts are placed in a covered pit, or frame, and are brought in as the earlier ones decline; thus a succession of varieties is kept up in equal perfection. And this makes it necessary, in order to have the house full to

the end of the season, to keep in pots more than double the quantity of plants, including all the varieties which the house will hold at one time.

[The difference between our culture and Mr. Munroe's is, that when we nip the tops off, it is to strike them; for the tops struck in July and August, after the plants have made their chief growth, remain beautifully dwarf, and flower large upon a very small plant. We should strike them in bottom heat, and go on as he has done, but ours would be a second crop, and flower almost down to the pot. We do not object to Mr. Munroe's method, but we never strike till the end of July, and then we have the plant very dwarf, and the flowers very large.]

TRAINING STANDARD APPLE TREES; BY JOSEPH SABINE, ESQ., F.R.S. &c.—“In a visit which I lately paid to the garden of Joseph Brookhouse, Esq. at Warwick, I was much pleased with a *method of training Standard Apple Trees*, which he has lately adopted. The apple trees alluded to are six feet high in the stems, from the tops of which the branches, which are of three or four years' growth, extend outwards, and nearly horizontally in all directions, from five to six feet from the centre. Round the tree, at about three feet from the stem, and at two feet from the ground, is placed a hoop, fastened to stakes, and towards this hoop the ends of the branches are directed by worsted cords fastened to their extremities, and to the hoop. The branches, by this means, assume a curved direction, straighter near to their origin in the centre, much arched afterwards, and having their extremities turned inwards. The average distance from the ground to the ends of the branches thus secured is about four feet. The general outline of the tree has much resemblance to that of a balloon, and the cords which are attached all round to the hoop in a slanting direction inwards, increase the similitude. After the fruit has been gathered, the fastenings are removed; in winter the trees are pruned, the upright shoots which have been made are shortened to spurs, except where fresh branches are wanted to complete the uniformity and regularity of the whole, and in spring the operation of tying is repeated. The advantages of the plan are many

and important. The downward inclination given to the branches increases the disposition to form blossom buds, and consequently to produce more abundantly; the foliage is well exposed to receive the influence of the light and air; the fruit is uniformly distributed over the surface of the tree, and does not suffer from being shaded by irregularly placed branches; whilst the ligatures at the ends of the shoots keep the whole so steady, that they are never so agitated by wind as to lose their crop prematurely, nor do the branches suffer like those of other trees, by lashing each other in strong gales of wind.”

[Although these remarks were read as long since as 1822, they contain many valuable suggestions applicable to the present day.]

DESTROYING CATERPILLARS ON GOOSEBERRY BUSHES, BY RICHARD WILLIAMS.—In the spring of one year, a very large number of caterpillars appeared upon almost every gooseberry bush in the garden here. Their number was so great, that I thought it useless to attempt to destroy them by picking them off, or by any other means which I had employed in former seasons; but having some quick lime fresh from the kiln ready for other purposes, I sprinkled some of it upon the caterpillars; and I saw that as soon as it touched them they dropped from the bushes. I then proceeded immediately to sprinkle every bush in the garden, taking up the lime in my hands at first, and afterwards in a small wooden spoon, standing on the side from which the wind blew, and dashing it in among the leaves of each bush. As soon as all the caterpillars had fallen off, I placed with my hands round the bottom of the stem of every bush about half a pint of lime, to prevent the caterpillars climbing up, and I saw no more of them. But in about a month afterwards, a second hatch appeared upon some of the bushes, when I again used the quick lime with the same effect. What became of the caterpillars I do not know; I saw a good many alive upon the ground, under some of the bushes, the day after they had dropped off, but I suppose they all perished, for not a single one has been seen in the garden this year, though in every preceding year they gave me a great deal of trouble.





ALIBREXIA RUPICOLA.

Alibrexia rupicola, Miers (rock Alibrexia).—Nolanaceæ.

The natural order Nolanaceæ is not an extensive one, but it yields several ornamental plants to our gardens, of which the annual Nolas, and the sub-shrubby *Alona cœlestis*, will be most familiarly known, all of them bearing large blue petunia-like flowers. That member of the order which is represented in the annexed engraving presents a very different aspect from the plants just mentioned, but it is not yet, as far as we are aware, introduced in a living state to the gardens of this country. From all that we know of it, we should however regard it as eminently deserving of introduction; for though its blossoms are not large, they are numerous produced, and the habit of the plant is neat without being rigidly formal. Its aspect, moreover, is altogether different from that of anything which we now cultivate.

The plant appears to have been unnamed till within the last three or four years, although noticed long before, in 1823. J. Miers, Esq. has proposed it as the type of a new genus, which he has named *Alibrexia*, a word of Greek origin, applied in allusion to its growing naturally under constant exposure to the spray of the sea; the specific name *rupicola* refers to its character of growing on rocks: it does in fact spread over sea-side rocks, in positions where it is often washed by the surf, and constantly exposed to the spray.

The plant, which is sub-shrubby, of a fleshy herbaceous texture and prostrate habit, spreads in a dense mass upon the surface of the

rocks to which it becomes attached, becoming numerously branched with small twigs. These twigs are pretty thickly covered with leaves, which are small, and narrowly spatula-shaped, somewhat rounded at the apex; they are covered on both sides rather densely with short dark grey downy hairs, which are interesting when magnified, from being both jointed and also star-shaped (stellate). The flowers grow from the axils of the leaves singly, upon little stalks about half an inch long; they are seated within a calyx which is divided into five linear segments, and are themselves barely half an inch long, and funnel-shaped, the lower part within the calyx being slender, and the upper part considerably swollen out, ending in a narrow border formed of five short rounded lobes, having a minute toothlet at the apex, and becoming reflexed; they are of a fleshy texture and slightly downy on the outside; the colour is pale lilac. The stamens, five in number, are included within the tubular part of the flower, and are unequal in length, the filaments being slender, tapering, and glabrous, and rising out of dense hairy tufts at the base of the tube. The flowers are succeeded by from five to eight small fleshy drupes, which each enclose an ovoid rounded nut of woody texture.

It was found by Mr. Miers growing upon the rocks in the Caleta of Concon in Chili, in the year 1823, inhabiting, as already stated, the rocky sea-shore. We have no information of its flowering season.

Considerable difficulty is often experienced in the artificial cultivation of plants which

naturally grow near the sea ; and this has been supposed to arise from the difficulty, that must always exist, of imitating with any degree of success the conditions under which they are naturally found. Experience, however, does not point out to us, that in the culture of plants under artificial circumstances, the greatest amount of success is to be secured by most closely following the conditions under which plants are known to flourish in their uncultivated state. There are many reasons why in fact it may not be so ; and hence, to discover the best mode of artificially cultivating any kind of plant is a problem, the true answer to which can only be obtained by diligent study and experiment, guided by the known laws which affect the growth of plants. It is, however, highly proper, in the case of an entirely new subject, to imitate as closely as possible the natural conditions of its growth, in order to maintain it alive, and in a state of health adapted for this further inquiry.

These considerations may guide us in recommending how to cultivate the plant under notice. It must have the protection of a greenhouse ; and it should have also a mild and bland atmosphere, at no time of a very arid character, but rather, on the other hand, freely charged with moisture ; atmospheric moisture, however, must not be stagnant about it, for this will induce mouldiness and decay. The pots in which it may be planted must be well drained, with a large mass of potsherds beneath the soil, which should consist chiefly of sandy loam, as being one of the purest earths at command. Amongst this soil, in the progress of potting, lumps of soft stone may be introduced ; these lumps may vary in size from that of a walnut to that of an egg, and, before being used, may be saturated in a strong solution of salt. At the surface two or three larger lumps of stone—also saturated with salt—may be introduced, and these may rise a few inches above the level, the plant

being fixed between them. Over these stones, and covering the entire top of the pot, the plant should spread, which would be its natural habit ; and in doing so all formal training and pruning should be avoided, the picturesque natural growth being preferable to the monotonous outline produced by the modern pruner and trainer.

We are not aware that in the culture of sea-shore plants the introduction of soft stone saturated with salt, has ever been adopted. We have known such plants, with more or less advantage, watered with salt water, and under any circumstances a weak saline solution must be more accordant to the nature of such plants than purer water. We have also known strong brine to be placed with the plants, though in a separate vessel, both being confined beneath a hand-glass kept nearly closed ; and this has been attended with advantage. There is no doubt that maritime plants have a relish for salt, and it should be supplied them, the only question being how best to apply it to suit their individual wants. The weak solution, used at all times instead of common water, seems to be the safest and best form in which it may be commonly employed.

The full exposure of the plant to the influences of light and of air, would seem to be essential points in its management, as there can be no lack of either the one or the other of these agencies in its natural state. Propagation may be effected either by cuttings or by seeds ; the former planted in sand, and not kept too moist, and the latter sown in sandy loam.

The species of *Alibrexia* under consideration, and another, also from Chili, have been well elucidated by Mr. Miers, in an article published in the *London Journal of Botany* ; and a beautiful drawing of the former, from which our engraving is prepared, is given in that gentleman's *Illustrations of South American Plants*.

FLORISTS' FLOWERS.

PREVIOUS TO AND SINCE THE PUBLICATION OF GLENNY'S PROPERTIES OF FLOWERS AND PLANTS.

We hardly know anything which progressed so rapidly as the improvement of florists' flowers and plants. Although we can trace the existence of show flowers more than a century, there was very little difference between the oldest that we can see engraved up to the year 1830. A decided advance was made from the moment Mr. Glenny began to write, and this advance continues in spite of the vast opposition encountered among dealers, who naturally endeavoured to keep up the character of their faulty varieties, and saw that if the public once adopted the pro-

perties as laid down by Mr. Glenny, there was an end to the purchase of three-fourths of their previously popular varieties.* Some of these properties have been only recently published, so that the flowers have scarcely had time to improve ; many flowers and plants, however, of which the properties were early published, have greatly advanced, and as it will be some-

* The whole of Glenny's "Properties of Flowers and Plants" have been collected, and are now published, in a shilling volume, by Houlston and Stoneman, Paternoster-row.

what amusing to trace the progress of their improvement, we mention a few of the most popular.

THE AURICULA.—In the Florist's Directory, published by Curtis and Miliken, and in sundry other old books, there have been certain things written under the head of "Criterion of a good Auricula;" evidently done from the contemplation of some favourite flower already raised. From this criterion we may infer, that an auricula should be bordering on roundness, and decidedly flat: whether the green edge is to be broad or narrow, whether the eye was to be large or small, are left altogether undefined. The consequence was that even the show flowers were sometimes seen with scarcely any edge, and at others with scarcely any ground colour; some were starry, as Cockup's Eclipse; others crumpled, as a bad Privateer; and there was a great evil to get over in selecting seedlings that deserved prizes. It was at this period that the value of sound principles was doubted; men used to growing the auricula were inclined to trust their own judgment, without once considering that they had been wrong for many years; without once remembering that, although seedling prizes had been awarded for years, season after season, nothing had been added to our collections, and the head seedlings had never been heard of any more after they had won these prizes. The properties, as laid down by the author we have quoted, were of great service to the amateur public, but the growers knew too well what they were about to encourage the diffusion of this useful knowledge; nevertheless, amateurs began to think for themselves. When, as the author directed, they looked for round flowers, they would find none, but they rejected starry ones, and Cockup's Eclipse, one of the prettiest coloured flowers then admitted to show, was thrown aside. The writer, in his essay on the properties, tells us to take a pair of compasses and make a circle, by opening them the eighth of an inch, and let this represent the tube; open them then to a quarter, to represent the circle of white; open them three-eighths, to represent the circle of ground colour; and then to half an inch, to form the outer circle; and this was said to be, and in fact proves to be, the perfection of proportion, to give richness to the auricula. Cockup's Eclipse, perhaps, owes its expulsion from the stage, as a show flower, to the points on its petals, in some degree, but to its large tube much more, for that is insufferable; yet, before these properties were published for a guide, that flower was almost always one of a winning pair,—disliked, but the growers knew not why; condemned, but still used. Its large pale tube, and the points all round the

edge, were the cause of its being disliked, but as there was no recognised law of taste against either, it was for years shown with the Privateer, or the Lancashire Hero, often the best in the pair of flowers. Upon the strength of these properties the seedlings of later days were selected; and although for years hardly an addition was made to the show flowers, those which have had prizes awarded according to the properties they possessed are gradually becoming favourites. Dickson's Unique, the very first we believe that was noticed under the new laws, is rapidly rising in public estimation, for though it is nothing like perfect, it surpasses most of the other show flowers.

THE POLYANTHUS is almost the only flower which can be tolerated with a scalloped edge, and this is decided by its peculiar nature; the flower has five or six divisions nearly down to the eye, or yellow circle within the colour, and every division being a sort of heart shape at top, that is to say, indented in the middle, it forms of itself a scallop. Its peculiar character, then, being determined, so far as this is concerned, the true circle is out of the question; not that it might not, if desirable, be got as perfectly round as the auricula, but there is another peculiarity,—the divisions down to the eye, that is to say, through the ground colour, being laced with yellow or lemon colour, and this lacing going all round the edges of the scallops, unlike any other flower, the only point that could secure uniformity was to have this lacing go down the centre of each division, and so form a complete subdivision to match the lacing down the divisions, every one being so alike that the flower should look as if it were formed of twice the number of divisions. The improvements most required, then, to enrich its appearance have in the main points been recognised of old; Mr. Glenn's properties determined that the shallower the scallops were, the better, and that the lacing should be positively uniform. The show Polyanthus, even the best of them, are too deeply divided, giving the flower too much the figure of a star, instead of each division and subdivision being gently scalloped with so many segments of circles. The prevailing faults of the polyanthus generally, are: first, indistinctness of the ground colour, that is to say, it is rough on the edges, as if they were dabs of colour, instead of being clear and well defined; the yellow of the lacing is of a different shade to the yellow of the eye, and the eye itself often of two shades of yellow; a disposition to be blotched with a deeper yellow (even some of the show flowers, held in some esteem for their size or their bold trussing, or strength of growth, are by no means free of this fault): the centre subdivision is not so deep in many varieties as the

indentation where the actual division of the flower takes place, so that instead of forming uniform scallops, they exhibited every other one of a different character. To observe a flower of this kind by the side of one moderately accurate on that principle, is sufficient to offend even an unpractised eye, though the observer may be unable to explain why he does not like it so well. Burnard's *Formosa* has been held up as one of the fine varieties, but the scallops are indented greatly too much; and some of the larger and coarser varieties have the great fault of indistinctness, defective lacing, deep scalloping, and two colours or shades of yellow. Our author holds it indispensable that the scallops should be shallow, by which the flower approaches the complete circle as nearly as it is possible a scalloped flower can; and the nearer it is to a circle the better. The flower, from this very improvement, looks bolder, larger, better filled up. The yellow should form as perfect a circle as in the auricula, and the lacing should be uninterrupted from this yellow circle round every division, and return down the centre, where the subdivision takes place, and be perfectly the same width. The divisions should just go through the ground colour, but not crack the yellow; the flower should be perfectly flat, the divisions not be perceptible from the subdivisions; the yellow should be as wide from the edge of the tube as the coloured and laced portion is from the edge of the yellow, or, to use the same kind of definition as exemplifies the auricula, the compasses opened one-eighth of an inch should make the circle for the tube, opened three-eighths, it should make the circle for the yellow, and opened five-eighths to reach the outside of the bloom. The pips should have six divisions and six subdivisions. Colour is a matter of taste, and Mr. Glenny has, in all cases, wisely we think, adopted that plan; for no two persons agree upon the shade of colour which is prettiest in anything: florists, as well as amateurs, prizing that the most of which they have the least; but he in all things requires, that whatever be the shade, it should be dense, which may be best defined thus:—A white flower dyed with pink would exhibit a watery poor appearance, as if the white was struggling to be foremost, but a flower of which the whole composition was pink, would look rich if ever so light. Another thing may describe it; the colour inside a geranium petal is often dense, and the outside washy, or poor. In short, on water-coloured drawings, the body colours are dense, the transparent colours are not; the lightest possible shade may be as dense as a scarlet. To return to the *Polyanthus*; it is at present very imperfect, and there is great room for improvement; not only so, the flower is capable of being per-

fect. There is no obstacle of any kind to its improvement, but the flower is so universally grown as a border flower, that it is difficult to save good seed unless everything of the kind is discarded; no primrose, cowslip, oxlip, or common *Polyanthus*, should be grown near the few choice ones from which seed is to be saved.

THE TULIP.—Some have objected to Mr. Glenny's want of definition in the form of the Tulip; Mr. Groom differs from him altogether. A northern writer takes Mr. Glenny's form, while he writes against it, and sundry old writings are altogether opposed. Mr. Glenny, it will be observed, fixes the standard in a way which nobody can mistake; it is to form from one-third to one-half of a hollow ball or globe; he was the first to fix it, in opposition to all previous writers, at a portion of a globe. The old authors decided it should be in form of a cup, without informing us what sort of cup; but as they afterwards define a little what they mean, by saying it should project horizontally, and then turn up, we are to presume they meant the common drinking horn. But nothing can be more definite than a portion of a hollow globe or ball; and in reply to the remark that it was undecided, Mr. Glenny insists that every shade between one-third and one-half is perfect, and one not better than another; that all it exceeded the half or fell short of a third, would be bad; and for our own part, it seems to us, that other authorities must give way to the more experienced. But we recollect to have seen at a small meeting of florists a bloom of, we think, Clark's *Musidora*, almost as dark as a breeder, that was as near as possible half a hollow ball. It was not, of course, level on the edge, and it will be some time before we come to that, we think; but it was measured, and gauged, and decided that, in respect to its general form, it was as near the standard as may be, and all agreed that it was beautiful. In the warm room it soon opened rather more, preserved its cup-like shape, but was a complete third, where it remained for hours, and at night went back to rather closer than half. Now, in every stage of that flower, from the time it was half a globe to the opening out to a third, it was to our fancy the perfection of form. With respect to the marking of a tulip there is but little difference of opinion now; Mr. Glenny holds that in a flamed flower the flame ought not to run into the feather, and that in a feathered flower the feather ought not to go so low down the sides of the petal as to interfere with the purity of the bottom, nor ought the beam or flame. There ought to be a large portion of the base perfectly clear of any colour, but its own pure yellow or its own pure white. The marking on the six petals (or, as

some of the botanists would persuade us, the outer three divisions are the calyx, we ought, perhaps, to say the three petals and the three sepals) should be alike, for a want of uniformity in this destroys the beautiful effect altogether. The thickness of the petal is necessary to its holding its form, retaining its colour, and producing a clear white or yellow; for thin petals are always transparent, watery, poor, independently of their fading soon and going out of form. Smoothness on the edge is manifestly necessary, as all rough edges are blemishes in everybody's eye, and pointed petals would destroy the cup-form altogether. Bed tulips are not looked at so squeamishly; gaudy colours are necessary, and the higher coloured flowers are for the most part stained in the bottom. All writers, not Mr. Glenny merely, but all the other writers, seem agreed that there should be no breeder colour; that the entire colour of the breeder should be concentrated into stripes and feathering, or beaming, which consequently come much darker than the original breeder colour, which in the very best breeders is dull compared with the colour of the markings when broken. The height of tulips is of no importance as regards their quality; whatever there happens to be least of, and most wanted, takes the lead in preference; but a tulip is quite as valuable eighteen inches high, as three feet. The tulip fancy, although attempted to be divided by some writers, have come to a complete avowal that the properties laid down by Mr. Glenny are the only right and proper ones, and that the opponents have no excuse for their silly endeavours to keep up an opposition. There is no flower on which the proposed standard has had more effect. In many places flowers are discarded if stained at the bottom. Even a tinge at the bottom of the colour is a drawback, though the bottom beyond it be clean; and if the colour reaches low enough down to break into the round pure base of a tulip, it is considered very faulty. This is as it should be, and the sooner all Societies avow the standard on which flowers are to be judged, the better.

THE HYACINTH.—There is no flower among the whole range of those to which properties have been dictated, so thoroughly short of perfection as the Hyacinth, and it will take some years to make much advance. The closeness of the spike of flowers may be found in many, but the individual pips are far short of being round, and still farther from symmetrical. The petals are, for the most part, ragged, pointed, confused. The best individual pips are to be found in some varieties which have them too far apart, but there is every probability that the points which may be found in several different varieties, will one day be combined in

a new sort; this would be a great advance. There seems to be hardly any argument needful to show that the spike of bloom should be formed of round symmetrical flowers, touching each other, and tapering towards the top to a single bloom, which should form a crown. In single and ill-shaped flowers we have very many that are remarkably close together, single ones especially, but there is a confusion about them that takes off all the beauty in the eye of a florist. There are a few which have a very near approach to the well-formed spike, and even approximate to closeness also, but the individual pips are not round, nor double enough. The single flowers should consist of one row or circle of rounded petals; the double ones of three or four rows, lying over one another, like the tiles of a roof.

THE CROCUS.—Simple as this flower appears, it is astonishing the difference there is between a well and an ill-formed flower. Mr. Glenny's original paper on this subject was thought frivolous; the Crocus was looked upon as an early brilliant flower, and then it all ended; the blue, white, yellow, and striped, were the only distinctions thought of, and it was thought to be descending too much to say anything about what the properties should be to constitute perfection. However, there is one seemingly universal property applicable to all things,—breadth of petal: at least three-fourths of the now numerous varieties of the crocus are, when expanded, a star of six points; but the properties which constitute perfection are similar to those of the tulip. The rich appearance of the cup form throws a charm over the crocus which, imperfect as they have yet been seen, throws all others into the shade. Nobody can form an idea, without seeing some of the worst and some of the best, what a magic there is in the simple difference between a wide and a narrow petal. The Dutch growers of tulips and crocuses are already beginning to appreciate the English taste founded upon the properties laid down, and we shall not be long before we have offered in the Dutch catalogues, varieties, accompanied by an assurance, that they are well-formed English show flowers. We have not as yet had much distinction made in the English catalogues, but we have seen twenty sorts, and one or two pretty good we pointed out as the nearest we could see to the description of a perfect flower. These will doubtless be offered with a good character whenever they come out, and the remainder will not be wanted; they were for the most part new ones from Holland, and none but the best were ordered.

THE CINERARIA.—The properties of the Cineraria were not thought of until the appearance of these papers, and they created pretty nearly as much surprise as the pro-

perties of the Heartsease. No one could look at the pinking starlike flowers, with narrow petals, not half so wide as the distance from one to the other, with deep notches at the ends, and fancy it possible to make it into a circular flower; but the confidence inspired by other published properties induced florists to try their skill, and judges to adopt the standard. We now have the petals widened to touching, the notch in some varieties disappeared, the texture in others greatly improved, and the colours diversified in all ways; and if those who have to give prizes for the new ones will abide strictly by the rules, and give no prizes to secondary qualities, we shall soon see the standard very closely approached, if not wholly attained. No flower ought to have a prize unless it has some decided improvement over all others. Some one feature bordering on perfection should be attained, before certificates, or any other distinctions, should be given to a new flower; and were it not for favouritism or carelessness in awards, we should not have the number of very middling flowers that now fill catalogues, and half fill the tables at public shows.

THE RANUNCULUS had already approached in some of its varieties a very respectable standard, but in even this flower the properties being more clearly defined has been useful. Some of Messrs. Tyso and Son's seedlings have been valued for their near approximation to the properties laid down; and Mr. Lightbody's principal seedlings are appreciated on the same account. The Ranunculus should be two-thirds of a ball; there is no mistaking this; a straight-sided flower, with high shoulder and flat face, is no longer valued. The thin petalled flowers, although very pretty, have been thrown into the shade. Now that the evil is pointed out, everybody can see that thin petals will not hold their form, that they cannot be so full a white or yellow, nor can they be half so perfect of any other colour; their petals are always semi-transparent and watery in appearance, and never under any circumstances look so rich. A thick broad petal, with its smooth edges, will hold itself in form, while the thin ones are good for little or nothing. We want a few, of any colour, of the proper form (two-thirds of a ball), and the ranunculus would be almost a new flower.

THE PANSY is one of the flowers which, even in the recollection of the present race of growers, was a mean little weed, hoed out of all the gardens in which it obtruded itself, as not worth notice. To Mr. Thompson, of Iver, do we owe its rapid advance in size, which was at first the only property appreciated, and in the diversity of colours, which were admired or condemned, according to the taste of the individual giving an opinion.

Nothing could be much worse than the favourite flowers, when the properties of the pansy were first proposed; they were long, jagged edged, deeply indented, loose, thin, and ragged, and nearly every variety had the three lower petals of different colours. It is worthy of remark, also, that although the required qualifications were strongly disputed at first, the best florists now unanimously approve and act upon them; so much so, that judges would be considered to have some sinister object if they awarded prizes upon any other principle than the near approach of the flower to the standard.

THE DAHLIA.—The form of the Dahlia must be two-thirds of a ball; and the principle is good, for, although half a ball would show as well to look exactly down on, it requires more thickness to give richness to the ordinary view of the flower. No one has ventured of late years to dispute one of the points, though several have given the same criterion of a good dahlia as their own opinion, instead of the criterion originally laid down. This flower, like the pansy, has very nearly approached the standard of perfection.

GERANIUM.—The Geranium was as singularly formed as the pansy; but as if the writer was wedded to the same form for everything, even the geranium must be round. The approach to this has been slow but sure, and Mr. Beck has now left all the raisers behind him, with a few novelties. Not that even his are round, but they are immeasurably better than most of the varieties in cultivation, and approach very close to the standard of excellence. Perhaps the writer's greatest triumph over prejudice has been in this flower. The enthusiasm of collectors to seize upon anything that would diversify their stocks, rendered great services to raisers, who pressed into the market hundreds that were thrown away as soon as they were bloomed. The flower is found to be more rich in appearance, more beautiful as a single bloom, and more compact and handsome in a truss, in proportion as they attain the properties pointed out. The awards at Chiswick are all founded upon this standard.

THE VERBENA was considered by many as a plant only for bedding out, and not a florists' flower; but the attention to the plant induced by these properties has proved it otherwise, and is one of the many evidences of their advantage. Nobody ever dreamed of the Verbena, of which we a few years ago had very few varieties, becoming a florists' flower. The beautiful scarlet flowers of Verbena Melindrea, whose creeping habit and fiery colour rendered it the finest of the bedding-out subjects, were narrow-lobed, notched, windmill-like shaped; but in the teeth of this, Mr. Glenny insisted upon the flower being round to be

perfect: there was nobody who did not smile at the apparent folly, but it was soon acted upon, for nobody would buy narrow-lobed varieties, and we soon had them almost touching each other and losing the notch. Of course, there were those who could not anticipate a circle, and considered the attempt nonsense, but they soon found that the wider the lobes were the more handsome the flower, and that carrying on this principle till they touched each other, would make the windmill a circular figure. Considerably wider segments have already been attained, and every year gives us improvement. It is, therefore, not at all doubtful, that time, and constantly saving seed from the best flowers, will give us the form we wish to obtain. The points respecting the plants and the truss, must not be lost sight of.

THE NARCISSUS runs out into so many varieties, that it is difficult to say much of their present qualities. It must, however, be obvious, that if the white or yellow star-like ray which the flower exhibits when open, were perfectly round instead of being, as they all are, crumpled and pointed, it would greatly improve it in appearance. The Narcissus is a flower worth trying to improve, because it already possesses thickness of substance, which in all flowers is a grand desideratum. The cup which occupies the centre of almost all the varieties is a rich yellow, even among the most common; and it stands to reason that the more prominent this is, the handsomer the flower. The more circular the white or yellow petals which form a ray around it, the better. Then, as to the truss, no matter what flower it is, the undivided blooms should touch each other, so that there should be no vacancy—but not lap over each other, as that would be a loss of size. To do this neatly, the foot stalks must be of the proper length to allow it, and as short foot stalks would draw in the head or truss too much, the long ones must be stiff and elastic, to hold all the flowers in their proper places.

THE CARNATION and PICOTEE are, so far as form is concerned, alike in properties; and in the original promulgation of these the author and the old florists were at war; but then there was always a war between the northern and the southern florists besides, and so fuel was in the first instance added to fire. The properties of the Carnation had been given by Maddocks, but in the usual indefinite and uncertain manner, that people interpreted which way they liked. The reducing the form to a distinct figure, half a ball, was opposed by all parties: among others, Mr. Bates wrote strongly against it, as one of those impracticable things which would become a non-entity from the extreme difficulty of obtaining it. Since the rules have been promulgated,

explanations between Messrs. Bates and the author have convinced Mr. Bates that Mr. Glenny's notions are not in reality opposed to him, because it is possible to possess all the advantages he requires, and be up to the present standard also. Three rows of well-disposed petals, and a few to form the crown, are quite enough to make the half circle, if properly disposed. The necessity of attending to the class of the flower, which should be seen in every petal, will be admitted when it is considered, that unless there be a line drawn somewhere, there would be no telling a flake from a bizarre, and the proper place to draw the line is where the flower is perfect. If a flower be a bizarre it is distinguished by having two different colours on a white ground on each petal; of course, then, if any petal has only one colour it cannot be a bizarre. Where there is only one colour on the white ground of all the petals, it is called a flake, but if any petal has no colour or no white, it is called a run petal, and the flower is disqualified. The propriety of requiring every petal perfect can hardly be questioned, because if there were one allowed to be different, there is no reason why two should not be, and if two there might be more. The Picotee is differently marked, but in form and all other matters it is the same as the carnation.

THE PINK.—So many of the Societies have openly avowed their intention to abide by the properties laid down for this flower, that there can be little doubt of their being universally approved through the southern parts of the kingdom, but in the north they used to be content with two rows of petals; and though a pink then was pretty, it lay like a dish upon the stand, and was never esteemed as a full flower. How far we may ever find that ridiculous system disturbed remains to be seen, but the sooner the better. The semi-double Indian Pink would remind any one of a good many of the northern kinds, and when they have been purchased in the south, have been quickly thrown aside. The pink requires to be half a ball as much as a carnation or picotee, and the appearance of any vacancy or looseness would here condemn a stand; whereas, in the north, in some places they pull out all but the two rows of the best petals, and form a little bit of a crown sometimes with one or two of the petals, which they twist round to fill up part of the hole they have made by pulling the rest out. The beauty of a pink, besides its doubleness, consists in the edges of the petals being smooth instead of jagged, the lacing being perfect instead of partial, and the white being pure. Again, the petal must be thick to secure a good white, retain its character well, and preserve its form and colour. Thin petals will never do this, so that, were

a flower in other respects all one could wish, it would be almost useless unless the texture were firm and thick. Run petals in pinks mean those with no colour or no white in them, and one is as fatal as the other.

THE CHRYSANTHEMUM.—No cultivated flower had so little to recommend it as the Chrysanthemum: as it was for years exhibited, there was neither form nor character; a bunch or head of ragged blooms, in which it was difficult to find a single redeeming point, was the best that could be produced even with all the aid of greenhouses or pits, or other buildings. Joined to this, the plants were mostly as ragged and as ugly as their blooms, of which it is not too much to say, that nothing but the time of year at which they were produced rendered them at all acceptable. For years, too, it was supposed they would not seed in this country; but skill soon overcame this imaginary obstacle, and from the seedlings of this country the best now in cultivation have been selected. In this, as in other flowers, some guide was wanted by which a good one could be selected from a lot of bad ones, and hence the properties were published, not to accommodate the characters of those in cultivation, but an entirely new character—a new model of perfection. There was no means of instilling into the minds of the grower the necessity of perseverance in raising seedlings, but that of showing him what was wanted, and how far removed the present ones were from that standard. The raising of these plants from seed is, however, in its infancy, and much care is to be used in selecting and saving from the new ones only such as are in some conspicuous feature superior to the best of the old. A new colour should not justify selling a bad flower, though it might be pardonable to save seed from it to raise others of the colour that are better formed. The roundness, thickness, fulness, and freedom from notches, good centre and symmetry, are self-evident qualities that should and would have been generally recognised.

THE RHODODENDRON is one of the most grand and beautiful objects in the open ground, and deserves to be among the most prominent in any department of a good establishment. Previous to the publication of the properties, no attention whatever was paid to the form of a new flower, and so long as new colours could be found, they were preserved with extraordinary care and sold as new varieties, which in truth they were. All the most rich and beautiful coloured varieties of Smith's among the bronzes and bronzy-yellows, are of large size and bad form, and no one but such as may have seen some near the character they ought to be, could or can form the least idea of the vast improvement. Round blooms,

slightly cupped, form, when close together, a handsome rich truss, and reflect their colours to the best advantage; those which are frilled and pointed,—those with deep divisions, have a loose divided looking truss; those which have weak footstalks cannot hold their blooms up in that position which can alone form a compact head. We are, it is true, getting on with more regard to size and colour than form, but as better formed ones come to hand of the same colour, we shall assuredly discard the present plants with their very ugly shaped blooms. We are not insensible to the merit of those beautiful varieties which have been raised by Mr. Smith of Norbiton, but the best formed of these should alone be propagated, and not all of them; and seed from them among good formed ones, or from good formed ones placed among them, would doubtless be of some value; nevertheless, from the complexion of many, the recently bloomed, if we except the *Exeter campanulatum hybridum*, show a bad origin. Nothing can make up for departing from the properties laid down.

THE AZALEA INDICA has a flower constructed like that of the rhododendron, except that there is no truss, nor does the bloom come so completely at the ends of the great branches. There is no material difference in the description of the properties required. In this flower rapid strides have been made. Let any one look at the *indica alba* and *indica phœnicea* by the side of *variegata*, *Gladstonesii*, *lateritia*, and others of their stamp, and the value of the approach to the properties as laid down will be instantly apparent in a remarkable degree; and yet all these fall infinitely short of the standard. In fine, since the improved ones have come out, the finest colours in ill-shaped flowers have been blown upon, and many may be thrown away; but especially the common *alba* and *phœnicea* are rendered useless, while nine out of ten of the new kinds shown lately have been nearly unnoticed on account of their form being similar to those two, or worse. Thickness of substance, which is held out as a quality of the first importance, has so completely captivated the lovers of the flower, that we doubt very much if without that feature any new variety would be tolerated as a show flower, whatever it may attract, or however it may be purchased as a means of seeding or causing others to seed. The habit of these plants is of as much importance to us as the flowers. The sorts we have mentioned will support themselves in any form you wish them to grow; they will cover every portion with leaves, and ultimately with flowers; and therefore they have great claims, while they by contrast take from all the others which are inferior in that respect. Upon the whole, the

criterion of a good azalea, seeing as we do the present approaches to perfection and imagining the rest, cannot be amended.

THE ROSE.—Nobody ventured to give even a hint as to the properties of the Rose, till the present author ventured upon it, in consequence of seeing year after year new roses coming out constantly worse than the old ones, and also seeing that the public professed not to know a good one from a bad one. There does not, however, seem to be a point omitted that would add to its beauty as a plant and a flower, nor one adopted which is not calculated to improve the present race. The same principles, however, guide the adoption of all the points, and we must say, that on going round the exhibitions of roses in pots, as we have of late, vainly trying to find a dozen so good as our Old Cabbage and Provence roses, we cannot help looking at the author's perfect rose as a thing perfectly ideal. It requires a great stretch of imagination, after knowing the rubbish we have and the scarcity of really good things, to fancy a rose perfectly round and symmetrical, with thick petals, smooth on the edge, and a centre close and well up; and yet nothing short of this is recognised as perfection. Half the charm of a rose is, they pretend to say, in its confusion. This is an error; the charm is not in the confusion, it is in the colour and fragrance, and in the remarkable bud, which is promising all the rest as soon as the calyx parts and shows the colour. We are apt to fancy the charm in the confusion, simply because the flower has long been identified with that particular feature; but if it really were so, the public would not choose those which are least confused; the thing contradicts itself, and we shall see a very decided change in the sorts of roses cultivated and in the mode of showing them, before we do much more in the way of giving prizes for them, because, however pretty ragged roses may look, they are not to be compared to a double, symmetrical, well-formed variety, bloomed in perfection and shown singly. These properties, carried as they are through the distinguishing features of each family, will become as much law in this case as in all the rest.

Possibly there was more difficulty experienced in moving the public towards a proper taste for the rose than any other of the flowers. The rose trade was in a very few hands; these vied with each other in the number and flattering descriptions of the roses they sold and recommended, although nine out of ten were purely worthless; some double, miserably thin and fragile things, were sold out at great prices and called new, though so like others as to be of no use on that account, and so bad as to be good for nothing had they been like nothing. The properties of roses

were published in time to show the growers that the flowers must be double, the petals must be thick and smooth, the flower round in the outline, high in the crown; and some other particulars were mentioned that could not be got over or disputed, and that people now insist upon, unless they are wholly ignorant, when they give the orders. Catalogues of some hundred roses are, nevertheless, published, in which scores are called show-flowers, although they are not a tenth part so good as the common roses of a century ago. The passion of cultivators is for a number of varieties instead of the qualities of varieties. But, strange as it may appear, the nurserymen who grow the least number of roses are the best to deal with, for they have selected only the best. One nurseryman who had intended to grow roses for sale, bought everything he could hear of or see, old and new, and declared that he had rejected hundreds because he should be ashamed to treat his customers as others have treated him; and the shows already prove, by the contrast between the good and the bad, how far these are really deserving notice. There can be no disproving that the roses which come nearest to the style mentioned in the properties, are in every respect the best and deservedly the favourite.

CAMELLIA JAPONICA.—Here the properties affect the plant as well as the flower, and nothing we know of is more popular in its season. There is, in fact, nothing that beats a plant well bloomed. As an evergreen it is beautiful, as a flower it is in some cases almost perfect, but the vast majority are sadly behind in the form of the flowers. For many years the most ridiculous flower would make a new variety. There was no notion of perfection, nobody dreamed of looking for anything better than they had already,—it was, who could bloom best the flowers they had? and so it turned out,—anything tolerated in the shape of a flower. The difference in the style of flowers would almost deter one from laying down one property to govern the whole, but there is no mistaking a thing done on principle. *Eximia* was very symmetrical, though a pointed petal; *Imbricata* was very perfect, among the then race of flowers, but it was faulty; *Bealli* had a splendid petal, though the centre was bad, and *Double White* had its good qualities. Where then certain points could be found singly in separate varieties, there was nothing to prevent the combination of all in one variety; and so the camellia seems to have been subject to this interference in common with all the other florists' flowers and plants. There is no flower much more symmetrical than some of the varieties of the camellia. No plant looks so perfect as one of these in bloom, with all its faults; still the author seems to

have fancied it ought to be better, and at any rate determined the world should know what would look better if it could be obtained; and thus the perfection of flower, plant, and leaves, has been laid down with much the same precision as the properties of most other subjects; it will guide and has guided cultivators in the selection of the plants they ought to grow, and taught them what they may throw away or graft others upon, and in the course of the time necessary to produce seedlings, will make us still more select in our choice of new ones.

THE CALCEOLARIA is becoming more interesting as the flowers are produced more round, but nobody is sufficiently particular in the habit of the plants. The flowers once held out as perfect are rejected by all good florists; and had it not been for premiums actually given for a downright bad feature or character in a Calceolaria, we should have had by this time nothing but handsome shrubby varieties, a credit to the growers. It is not for us to enter here upon the subject of Societies actually encouraging herbaceous varieties, but to that one fact may be attributed the cultivation of such plants at all. We fear, too, that while the properties laid down here for the flower is the avowed standard on which prizes are awarded, the carelessness with which a plant of the herbaceous kind is distinguished for a prize, while an infinitely better plant with a smaller flower is rejected, does a good deal towards perpetuating the mischief. The principal point on which Mr. Glenný differed from Mr. Green in the properties of the calceolaria is, that the former will have it round every way like a cherry, while the other is content with it almost flat; and the former is unquestionably right, because, if you turn a plant sideways, and look at the edges of the flowers instead of the front, a flat flower looks pinking and unmeaning, while the other would be grand and imposing. It is in these things that the author of "Properties of Flowers" has completely passed his competitors, and established standards which none have thought of, and the propriety of which most have disputed. Few calceolarias have yet approached the form of a ball, or been much distinguished for any great departure from the original flat flowers which were once held up as models, although some have come forward of much more thickness than we have seen for a considerable time; and they, like many other flowers, are on the road towards the desired form. The colours are becoming more brilliant and diversified every season.

THE FUCHSIA has been spoiled for a time by the introduction of the coarse and brick-dust-coloured varieties raised from *Fuchsia fulgens*, which seeded without the least care or trouble, and furnished as pretty a set of

weeds as ever discredited a collection of plants. The properties of this flower had never been laid down when the author took up the subject, and held up the globosa form as perfection till it opens; but then, he says, the petals should turn up like a cyclamen, and show the inside surface; moreover, he condemned all selfs, and insisted upon a contrast between the corolla and the sepals; further than this, he repudiated all the varieties which bloomed in bunches at the ends of the branches, and insisted that the flowers should come out from the base of every leaf, and hang all along the branches, and it stands to reason that a plant cannot be of a good habit without this. Nor does it want much consideration to bring us to the conclusion, that the more contrast there is in the flower, the more striking it must be; and as the inside of the sepals is always, like the petals of all flowers, brighter than the outside, the turning up not only shows this brightest part, but it also exposes the whole of the corolla, which is a very distinguishing feature in a fuchsia. It does not seem to matter much what the contrast is; white and violet, or purple, or scarlet, would be good; scarlet and dark purple, or rose colour and dark purple, would look well; but the white of many coarse varieties is tipped with dirty green, and does not at all tempt people to buy them of that character; indeed it is held out as a positive blemish. There does seem a consistency in all these matters when we turn over the subject fairly, and the fuchsias of the present year will be appreciated by their approximation to this standard, as sure as they are shown; nor does it matter where, for judges begin to see there is no empty dogmatic assumption, but that the science of estimating plants is reduced to a principle.

THE PETUNIA, although, like the verbena, a flower for bedding out, has begun to assume the character of a florists' flower. It is no longer a flimsy self, but a parti-coloured flower, of which there are some getting substance, and form, and character, as if disposed to make the best of its way to perfection. The properties of this flower will be as well understood by the public as by the author, because there is no mystery about the matter. The flower is to be circular, and thick, and smooth at the edge, rather of a trumpet form, and of bright or interesting colour, and the plant shrubby; the flowers plentiful: all this is as well understood as if it had been the original character of the flower, although it is not only its new character, but it is one it has not yet fairly acquired. There is already as much difference between a good and a bad petunia as there is between a good and a bad coin. The one is flimsy and of no form, the other is stiff and bold in the front, and fit to plant

anywhere. It is true, there are still many bad ones, but until there are enough good ones to supply, the bad and middling must do. There is every prospect that the petunia will give every kind of stripe and blotch among the prevalent colours that distinguish the family, and there is no doubt but that the flowers will be got as thick as almost any flower that grows in the ordinary way.

THE PHLOX.—The Phlox was formerly equally narrow, equally awkward, and equally bad shaped as was the verbenas; but this also was decided to be round to be perfect. We have latterly seen some varieties from the Stowmarket nursery as round and as flat as a shilling. Thus it is through all the flowers that have a standard, people reject those which are unlike it or which do not approach it, and the dealers are obliged to throw away the worthless.



RESTREPIA ELEGANS.

Restrepia elegans, Karsten (elegant Restrepia).—Orchidaceæ § Malaxæ-Pleurothallidæ.

This is a small but very pretty orchid, not yet introduced to the gardens of this country, but cultivated in some parts of Germany. Our illustration is derived from the *Auswahl Gewächse Venezuelas*.

There is something peculiarly neat in the habit of this plant, apart from its really pretty and singularly-shaped blossoms; it is, however, too small to produce any very great show. The plant grows in tufts, the little round stems being from one to two inches long, bearing each one leaf at the summit, and invested about the lower part with pale-coloured membranaceous scales. The leaves are small, elliptical, of a dark green colour, and rigid

fleshy texture. From the axils of the leaves, and apparently at the top of the little stems, grow the flowers, sometimes singly, and at other times in racemes of from three to seven blossoms; they are supported by a slender stalk two inches long, and as one or other of the flowers is almost continually expanded, the plants remain in an ornamental condition for a long time. The structure of the blooms is very curious; the upper sepal is narrow, terminating in a long, and at the apex thickened, point, and is marked longitudinally with three red lines; the lower sepals cohere together, and form the most conspicuous part of the flower; they are oblong, recurved at the apex, and are of a deep yellow colour delicately spotted with red. The petals are narrow, with longitudinal red lines, and stand out like a pair of horns. The lip is about half the size of the conjoined lower sepals, and of the same colour and form, except that it has an incurved tooth on each side near the base. The expanded blossoms are about an inch and a half across.

This species was found by Dr. Karsten, growing on the knotty branches of trees of different kinds, in the province of Caracas, at an altitude of 5-6,000 feet, and he remarked that the plant preferred moist and shady places in very aged woods. It was in flower in almost every season of the year, but most abundantly from December to April.

The plant requires a mean temperature of fifteen degrees Reaumur, (about sixty-six Fahr.) for its successful cultivation. It should have a moist atmosphere, and a shady situation in the orchid house. It should be grown attached to blocks, which may be of any kind of wood except the resinous timber of the coniferous tribe: the rough-barked wood of the cork-tree is very suitable; or blocks of other timber, of which the surface has been charred, may be employed. The plants are originally attached to the blocks by means of zinc or copper wire, but after they begin to grow, they soon attach themselves firmly by means of their roots. When a plant is first attached to a block of wood, the base of the plant should be placed near one extremity of the wood, in order that as the plant increases and extends itself, it may have room to spread over the bare portion of the block; without this precaution the blocks become too small in some parts for the plants, and this involves the removal of them, an operation which is neither easily performed, nor altogether harmless to the plants, especially to those whose roots most firmly embrace the wood. In this, as in other cases, the plants must be kept drier than ordinary, when not in a growing state. It may be readily increased by dividing the tufts in which it grows, but

those who possess the plant, will find it most desirable, in an ornamental point of view, to secure good masses.

A DAY IN THE WOODS.

BY THE REV. C. A. JOHNS.

AN unusual proportion of the present year has been characterised by the raw chilliness which has for many generations been considered the heir-loom of March; nevertheless, the luxuriant herbage which clothes our fields and meadows cannot fail, in spite of our disinclination to throw off our great coats, to remind us that the bright, merry days of hay-making are not very far distant, and that not long afterwards we may be thrown at once into the middle of a season so sultry and scorching, that we shall almost fancy ourselves labouring under a delusion when we try to recollect the exact time at which we found ourselves actually cooler than was agreeable. A quiet lounge under a wide spreading beech will not then, as now, be suggestive of damp, and its grumbling lackey, rheumatism; but the prospect of even a distant hanging wood will tempt us for a while to forego the unsatisfactory protection of brick walls, and to melt under the influence of a meridian sun, for as long a time as it will take us to traverse, with such activity as we dare to put forth, the interval between the house, which is now literally "too hot to hold us," and our leafy shelter.

When once arrived there, the first perceptible difference that occurs to us is, that we have ceased to be growing hotter; soon we fancy that we can discover a slight, very slight, motion of the air, though none was perceptible in that odious road, where, with all our caution, we could not help leaving our dusty track in the air. We have not yet forgiven the postman who, himself lifted out of the cloud that followed him, smiled triumphantly as he looked back and saw us crouching in the hedge until the nuisance that he had created should have subsided to at least the height of our chin. But now we can breathe freely, and are growing amiable again, and have recovered our equanimity sufficiently to recollect to what we are indebted for our altered circumstances; namely, first, to the actual shelter afforded by our leafy canopy; secondly, to the rapid evaporation of moisture carried on through the leaves; thirdly, to the extensive surface of radiation afforded by the trunks, branches, and leaves of the trees by which we are surrounded; and lastly, to the gentle movement of the air itself, which is on its way to the outside of the wood, there to supply the place of the heated air which is ascending.

But let us, while we have it in our power,

banish all recollection of our late discomforts, and give the reins to one of the many pleasanter trains of thought which may well be suggested by the objects around us. For instance, let us examine into the claims which may be asserted in behalf of our forest and woodland trees, to be considered natives. To be methodical, we will divide all trees known to grow in Britain into four classes. In the first we will place those which every body, who is in the least degree acquainted with the produce of their own country, knows to have been introduced. This class we may dismiss at once, as it will comprise all that we do not mention below. The second shall contain all which are generally acknowledged to be of British origin, or at least to have been naturalized from the remotest antiquity. The third may include those respecting which doubts have been entertained, but which nevertheless have claims, more or less satisfactory, to be considered natives. The fourth class will then comprise the remainder, those, namely, which are either not generally known to be naturalized foreigners, or which have some pretension to be considered natives, but the evidence preponderates against them. The word *class* is of course not used in its technical sense, but as a convenient term for bringing together the names of objects which possess certain common attributes or characters.

CLASS II.

Alder.	Juniper.
Ash.	Maple.
Barberry.	Medlar.
Birch.	Mountain Ash.
Bird-cherry.	Oak, common.
Black-thorn.	— Durmast.
Cornel.	Poplar, white.
Clematis.	— black.
Elder.	— trembling, or
Guelder-rose.	Aspen.
Hawthorn.	Service-tree.
Hazel.	Spindle-tree.
Honeysuckle.	Willow, upwards of fifty
Hornbeam.	species.
Ivy.	

CLASS III.

Apple	Lime, small leaved.
Beech.	Pear.
Elm, five species.	Yew.
Fir, Scotch.	

This list comprises the trees which, though said by some to be of foreign origin, appear to us fully entitled to be classed among those of native growth. The Apple is conjectured by Whitaker to have been introduced by the early Celtic tribes who first peopled Britain. Now, it is certainly impossible to prove that our painted forefathers did not bring over with them the choicest varieties of apples known in their own country; but even if this be granted, it does not necessarily follow that the wild apple did not grow in Britain as

well as on the continent before they came. It being therefore an undoubted fact that the Apple has every *appearance* of being wild, and there being no evidence whatever to show that it is of foreign origin, we may, in all fairness, decline to prove a negative, (which, from the remoteness of its matter, our opponents may safely challenge us to do,) and consider it to be a native tree, until it has been demonstrated to be otherwise. The same may be said of the Pear, which also, it has been *conjectured*, was introduced by the Romans. Some authors contend that the Elm is of foreign origin, grounding their opinion on the undeniable fact, that this tree does not ripen its seeds freely. But there is not much in this argument, for in France, where it is without doubt a native, the Elm only ripens a part of its seeds; and Pliny says* that the loftiest Italian Elm, the Atinian, bears no seeds. In the two last mentioned countries, there can be no doubt that it is a native. Besides this, Julius Cæsar, who mentions the absence of the Beech and Fir from the part of the country which he explored, says nothing about the Elm. We may therefore conclude that he saw it in Britain, or he would have stated the contrary where he enumerates the trees which grew in Gaul but not in the newly invaded country. To suppose that it could have been introduced before his time would be absurd.

The Beech and Fir were long considered by the learned as exotics, but without sufficient reason; for, although in the passage cited above, Cæsar distinctly says that they did not grow in Britain, we must recollect that he penetrated but a little way into the country, (probably not so far as the Thames,) that he stayed but a short time, and moreover, that his opponents gave him too much to do and think about, to allow him to pay much attention to Dendrology, even if he were an adept in that science. We need not therefore discuss the question whether the word *fagus* is to be translated Beech or Chestnut, or whether *abies* was a Scotch Fir, or a Silver Fir; but allowing the original interpretation to be correct, we will admit at once that he did not see them, but will nevertheless maintain, that if he had been enabled to make a settlement in the island, he would have found them in abundance. With respect to the small leaved Lime, the weight of evidence is in favour of its being considered indigenous. Ray thought that it was so; and Mr. Edwin Lees appeals to a wood in Worcestershire, "remote from any dwelling or public road, of above 500 acres in extent, the greater part of the undergrowth of which is composed of the small leaved Lime." The Yew was undoubt-

edly planted in the vicinity of churches, at a remote period, and was very generally treated as a garden shrub, but it grows, nevertheless, in a perfectly wild state, in many parts of Great Britain. We have ourselves seen it in abundance, in situations where the foot of man never trod, many miles away from human habitations, and from any symptom of even the most ancient human labours.

CLASS IV.

Arbutus.	Lime, two species.
Box.	Sycamore.
Cherry, two species.	Tamarisk.
Chestnut.	

"The Arbutus is thought by some to be indigenous, and it is certain, that in England, in the fifteenth century, it was called the Irish Arbutus. By others, however, it is said to have been introduced into Killarney by the monks of St. Finian, who founded the abbey of that name on the banks of the lake, in the sixth century."† Though perfectly naturalized in this one spot, it is found in a wild state nowhere else either in Great Britain or Ireland; and we are consequently disinclined to allow its claims to be considered a native tree. For a similar reason, we have thought it safest to place the Box in the same list; though not without sundry scruples, which the reader will find stated at length in *Forest Trees of Britain*, vol. i. p. 161. The Cherry was introduced into Italy from Cerasus, a city of Pontus, B.C. 67, and into Britain about 120 years afterwards.

The Chestnut was originally brought from Asia into Europe by the Greeks, about 500 B.C. From Greece it was transported by the Romans to Italy, but at what time is uncertain; Loudon says, "in the reign of Tiberius Cæsar," an assertion which is very wide of the mark: he forgot probably that Virgil, who, according to his own account, frequently mentions both the full-grown tree and fruit which had ripened in Italy, flourished in the reign of Tiberius's predecessor. From Italy it spread over most parts of Southern Europe, and was probably introduced into Britain by the Romans at an early period. It appears from a deed of gift, granted in the reign of Henry II., by the earl of Hereford to Flexley Abbey, that Chestnuts were tithed. Hence we may infer that the fruit was highly esteemed, but certainly not that the tree which produced them is indigenous. Evelyn, led away by the mistaken notion that the numerous beams of Durmast Oak discovered in old buildings were of Chestnut, naturally held the opinion that it was a native tree, and quotes a passage from a monkish author, who lived in the reign of Henry II., to prove that there were at that

* Pliny, Nat. Hist. lib. xvi. cap. xvii.

† Loudon's Arboretum.

time, large forests in the neighbourhood of London where they *might* have grown. Sir T. D. Lauder considers this "strong evidence," but it is in reality no evidence at all, for the document in question contains no mention whatever of the Chestnut, nor the slightest allusion to it. On the whole, then, the Chestnut may safely be classed among our naturalized trees.

The Lime (*Tilia europæa*, and *T. grandifolia*) has no claim to be considered a native. It was, as Du Hamel reports, adopted for ornamental plantations in France, in the reign of Louis XIV.; and in Evelyn's time it was commonly imported from the continent into England for the same purpose. Botanists who are not so much dazzled by the glare of modern discovery as to have lost sight of the benefits conferred on science by Linnæus, hold this tree in great respect, for an ancient Lime, which grew where the ancestors of that great man had long resided, gave them their family name.

The Sycamore, from its abundance, and from the freedom with which it sows and ripens its seeds, might naturally be considered an indigenous tree; but it appears from Gerard, Parkinson, and other old writers, that it was originally introduced from the continent.

The Tamarisk is undoubtedly an alien. We have examined most of the living specimens in the south of England, with the anxious desire of being able to salute a "fellow-countryman," but with the most mortifying want of success. As it grows as freely from cuttings as the Willow, we are induced to conjecture that it was brought over from the other side

of the channel by smugglers. If the existing trees were suffered to die off without artificial renewal, there can be no doubt that it would become extinct.

It appears then that, reckoning the Willow but as one, we possess *twenty-seven* native trees whose claims to be considered as such have never been questioned. To these we may safely add *eleven* others, whose rights of citizenship in the British woods have been objected to, but on insufficient grounds; making in all *thirty-eight* native trees. The number of foreigners introduced within the last century has become so numerous, that future dendrologists will probably be able to enumerate many naturalized trees, which are now only known in the collections of the curious, and among them some which will prove scarcely less valuable than those of British origin: To the spirited individuals who devote their money and labour to foreign Arboriculture, society is more indebted than it is now aware: These men may possibly live only to discover in their cherished nurselings fresh instances of the wonders of God in creation: and even if this be all they are permitted to see, they will be richly rewarded. But they may look forward to much more than this; they may all sink to rest in the earnest consciousness, that, though they may not have risked their lives in protecting their native country from foreign aggression, they have been actuated by a motive no less patriotic, that *certainly* of adorning, *perhaps* of conferring a yet more substantial benefit on, the land that gave them birth, and of adding to the intellectual enjoyment of their countrymen.

A FEW WORDS TO THE OWNERS OF GARDEN ESTABLISHMENTS.

BY A RETIRED UNDER-GARDENER.

THE gentry of England find garden establishments much more costly than they ought to be, and to this cause alone may be attributed the conversion of many noble acres to market-garden purposes; for there are not a few who let their grounds rather than incur the expenses entailed upon owners by the present system of management; but this arises out of a perverted taste, a mistaken notion of the real value and the real use of a garden. An owner does not consider, perhaps does not know, that the same garden that will cost 200*l.* per annum under good management, besides yielding all the value as produce, would cost 500*l.* under other government, and yield less. A man may enjoy all the productions that can be wished, at their proper seasons, without incurring one pound more expense than a market-gardener spends on the same quantity of ground, and who has to get a living profit: the great difference is to be found

in the prevailing power—industry or idleness. A market-gardener has a piece of kitchen garden, in which he will grow everything that is marketable; he pays a foreman to time the men, and in justice to market-gardeners be it said, his men are better paid than most labourers in private gardens; the ground is well managed, it never lies idle; things are produced as early as skill and reasonable cost can be made to obtain them; they have to be gathered, and carried to market to be sold there; the wear of horses and carts, and the price of turnpikes, all lessen the profits, yet the man can live and save money. Why, then, should there be a system prevailing in gentlemen's gardens that shall make every cabbage cost sixpence, and every peck of peas a crown? Simply because gentlemen's gardeners have to live like the gentlemen themselves, and go partners with their employers. The market-gardener's foremen have to work,

and look after others ; they have to keep up a complete round of labour from week's end to week's end ; there is no shuffling allowed—no waste permitted. But it may be said that a gentleman's place is more general in its productions ; he has fruit to grow and preserve—so also has the market-gardener. His necessity for pruning, training, protecting, gathering, and preserving, comes on quite as fast, and it must be all done quick, as well as the gentleman's, and in nineteen cases out of twenty, it is done far better. In all the productive portions of the garden the same men, the same labour, and the same pay, should do for the gentleman's ; for the productions of the man who lives by them must be marketable, must be good. There is not a necessary or a luxury required in a family that is not grown by the tradesman who serves the public ; there can be no want of fruit or vegetables that may not be supplied from the market where it is sent by the man who grows it for his living. There is, therefore, no possible excuse for a gentleman being worse served than a trading master, nor is there any just excuse for making it cost more. But, the machinery employed is different ; idleness instead of industry—extravagance in place of economy, and sometimes ignorance instead of knowledge. Let us divide the evils under which the gentleman's establishment labours, into various departments :—

1. The sum paid for labour is greater than it should be.
2. The head-gardener has to live like a gentleman.
3. The tradesmen have to propitiate those who give orders.
4. The gentleman has to supply the gardener's friends.
5. Sometimes the gentleman supplies the market.
6. The gentleman has to pay for what he does not have, as well as for the things he does have.
7. The gentleman often has things out of season, which are not worth the expense that must be incurred, and makes an excuse for much more that need not be incurred.

We could find many other evils, but the foregoing list is sufficient for our present purpose, and we will take them seriatim.

1. *The sum paid for labour is greater than it should be.*

Take any market-gardener's establishment of any extent, and there will be an example of neatness, cleanliness, and regularity, not excelled in a gentleman's kitchen garden. A foreman is paid, perhaps, twenty shillings per week—his sole business is to direct, subject of course to the control of the master, but fully capable of directing any thing without him.

The great object in a garden of this kind is economy of time, labour, and money, and excellence of produce. The ruling principle here is, do nothing till it is required to be done, and neglect nothing which would increase in difficulty by delay. Instead of keeping three or four idlers to do two people's work, there is not one more man employed than there is work for. The foreman works, his example stimulates the men. If they come after their time they are curtailed of their wages ; they are therefore punctual. The foreman knows what a man can do, and ought to do, so that if any are at work out of his sight, they cannot idle their time without its being seen instantly ; and if a man attempt to shirk his task, if he betray anything like laziness, he is discharged for a better ; for the difference between an idle and an industrious man is something like twenty pounds per annum. Market-gardeners cannot afford to be imposed upon. Now turn to the gentleman's kitchen and fruit garden : there is a foreman and as many hands as will do all the work with half, instead of whole employment : Mr. Foreman is out with his friends when he should be in the garden, and the men are—like all other men who are not looked after—loitering away half their time. The place is kept full-handed, instead of the men being kept full-worked ; if a market-gardener could keep everything going with a foreman and three good men, there must, to a gentleman's place, be the foreman and five or six men of some kind ; they are generally paid low enough, and this engenders a notion that they work quite enough for the money ; days sometimes occur when there is actually nothing requiring to be done—how, then, to fill up the time ? why, hoe the ground where there are no weeds, rake the borders where they are clean,—something must be in hand, but the foreman is not seen after he has got together the vegetables and fruit required for the house ; he is at the Pig and Whistle at skittles, or on the Green at cricket, or he has some friends in his cottage, drinking and smoking ; or if he be a very prudent man, he is writing or reading in his room. But there is little or no work doing even when there is plenty to do, and the men when set about a job to fill up time, know as well as the foreman that it means they may do as they like, so that some one be left to answer lest they, or any one of them, should be called. The result of all this is, that the gentleman has nearly twice the amount in all cases, more than twice in many, to pay for labour alone. This is no exaggerated picture, it is a plain matter-of-fact description of the majority of gentlemen's establishments : the principal will not work enough to be worth calculating upon him, and

all under him partake more or less of the habits of the overlooker. It is in vain that the defenders of the present system deny the facts, or assert that in gentlemen's places a man does a day's work for a day's pay; it is, positively, only in cases where the employer is his own overseer, and can judge what should be done, that there is any exception to the prevailing vice of idleness, and the consequent employment of many more men than can be required if they all did their duty. In the present rage for scribbling, men are worth less than ever they were, and the masters who employ such people are more silly than ever, for it is the bane of business to divide the attention, and those who encourage talking and writing instead of working, pay the penalty in largely increased expenses: certain it is, that gentlemen pay in their kitchen gardens, which are generally also fruit gardens, but in what we may fairly call the productive part of their gardens, twice as much for labour as they ought, because there is twice as much purchased as is wanted.

2. The head-gardener must live like a gentleman.

Now, if the establishment is under the superintendence of a head-gardener, who must have either an under-gardener or a confidential man, nothing is more certain than the loss of his entire salary, and all the costs of his pleasure and patronage; he is nothing without his double—his under-gardener. He may condescend to look round the place now and then, and ask his confidential man, who called yesterday, whether "the governor" had inquired for him, and, if he did, what was told him, and so forth. He may observe something going a little too bad from neglect, and gently remonstrate; if his double has happened to be out, or engaged, and trusted to some one of the men to do the very little expected of the said double, and that same man has trusted to somebody else, or forgotten it altogether, the chiding of the master may be transferred, directly his back is turned, to the next unfortunate blunderer, and so the scolding go the whole round. But when the chief has said his say, he simply leaves word that if "the governor" should inquire for him, he has gone to A to see after some loam, or to B to order some pots, or to C to bespeak some peat, or to D for some seeds, or to some other letter of the alphabet on some other equally important mission; and having left these directions, with an admonition about the neglected duties before complained of, he takes the horse and light cart, starts ten miles to a fight, a friend, or a fair, and is seen no more until all the men have left work. If, however, as this occurs three or four times a week, Mr. Under-gardener wants a long day

for himself, the chief will condescend to remain on or near the premises; but it is told all over the place, and the people are all at their posts; however, if a friend calls on the gardener, he only troubles himself to go round, because his friend wants to see everything. If his eye meets anything strikingly wrong, he calls for somebody, and vents the usual quantity of complaints and threats on the spot, to show his authority and the labourer's submission, and proceeds all round. The retirement to the gardener's cottage, and regaling with the very best produce of the establishment, is a matter of course, and as the gardener finds all the butler's and housekeeper's friends with fruit and costly vegetables, the butler in return takes care that the gardener shall have the wherewithal to make himself and his friends happy. In short, the gentleman himself is not so thoroughly independent as the gardener—he commands all the luxuries of the garden, his only study so far as the house is concerned, being to supply what is required good enough to prevent complaints. If the house has the first cucumber, to show the skill of the gardener, the market, or some friend, has the first handsome brace: the establishment is kept up with all the costly appendages, to show what can be done, but not how much; to supply the family with enough to show the gardener is alive to all the luxuries, but to make sure of the little the house wants, there must be a good deal more done for the gardener, and his friends, or customers. The gardener, in fact, must live like a gentleman, at the expense of his employer; his wages are as nothing compared with his perquisites of office. If any lady's maid were to make up dresses for herself while she made things for her mistress, and steal the stuff for them by curtailment her mistress's materials, it would be called thieving; but the gardener may rob the premises of the best fruit, flowers, plants, and vegetables, and it is called perquisites; and these perquisites extend beyond stealing the produce of the labour, seeds, and materials, which the employer pays for, because there are certain tricks which tradesmen lend themselves to for the purpose of defrauding the masters.

3. The tradesmen have to propitiate those who give orders.

How far the system of robbing the gentry by the instrumentality of the tradesmen, may pervade the domestic concerns of an establishment, we know not, but some gardeners carry on this species of warfare against the purses of the English gentry with impunity, and almost without limit. They boldly make a demand of a per centage from every tradesman that serves their employers, and thus obtain hard money. Thus in the account:—

"Paid Mr. Nokes, the nurseryman, 42*l*." when in fact they only paid 37*l*. 16*s*. "Paid Mr. Styles, for building last new pit, 147*l*." when he only paid 132*l*. 6*s*. "Paid Mr. Smith, for painting houses and frames, 35*l*." when he only paid 30*l*. This kind of robbery goes for nothing. The tradesman sticks it on his bill because the gardener will have it off, and the gardener considers it a right because his predecessor did it, and, with a salary of 100*l*. per annum, managed to save 1,500*l*. in ten years. But some gentlemen will pay their own bills, as if there was any security in this caution against being robbed. Nothing is gained by this, if the gardener is allowed to order things, or to communicate with the tradesman. The gardener says, "I shall expect my per centage, and you can make out your bill, and take it to the governor; he will pay you, and I shall call for my commission." Accordingly, the gentleman, over cunning, grinds down the tradesman to the lowest shilling, and the tradesman, knowing what he has to do, acts accordingly; he will take off no more than he likes, because he has to give the gardener his "dues," as he calls them; and though he does not tell the employer this, the case is the same; the employer has not only to pay the tradesman for his material, or labour, or both, as the case may be, but he has to pay over, after this fashion, just so much as the gardener has arranged with the tradesman the gentleman shall be robbed of for his, the gardener's, private use. This system has prevailed to such a degree in garden establishments, that the expenses have been augmented to a degree scarcely credible; not only has five or ten per cent. upon all legitimate expenses been purloined, but the masters have been persuaded or goaded into ten times the expensive outlays that were necessary, for the sake of the premiums given to the gardeners by the people who execute the work. How else are we to account for the useless costly erections in all gentlemen's gardens? how else are we to account for the expensive changes of plan, the unmeaning alterations of houses, the frivolous, but nevertheless expensive apparatus for heating, ventilating, &c., that are recommended as grand discoveries of efficacious means one year, and condemned as useless or detrimental as soon as the expenses are paid?

Of late years, the gentry of this country have been shamefully taxed by the professional gardeners in their employment; the history of the last two years' progress in the art, or mystery, or science, of horticulture, forms an enormous list of frauds and follies; of gardeners making fortunes, and employers losing them; of gardeners getting rich, while their masters were ruined; and chiefly by means of that cunning, which, in the gar-

dener's opinion, gives him the full freedom to make use of his master's purse, and of all the means that his master's purse provides on the establishment. Abercrombie, when he wrote "Every man his own gardener," had a keen eye to the employer's interest, and to the general interest of horticulture; for it is only by making every man a gardener that the wealthy classes have the slightest chance of being released from the costly machinery by which even a common and very ordinary garden is kept going, if the main spring is a professional head-gardener. And it behoves every owner of a garden to consider well what his garden costs per annum, to add up all the items which appertain to the establishment, and to consider whether it cannot be better done at less money, by employing working, instead of holiday-making chiefs, and labouring, instead of scribbling under-gardeners. It is a monstrous absurdity that a man should pay a hundred a-year rent for his country place, live at the rate of three hundred more, and yet that his garden, which ought to be kept in good order by one good head and two good working gardeners, at a cost of 150*l*., should cost him twice that sum, or more than all his household establishment, and that, too, without pretending to have his fruit or vegetables out of season, or his flowers out of the ordinary way. Yet so it is. If a professional head-gardener be employed, he must have all sorts of things for himself, if not for the house; he must have all kinds of contrivances that cost money, for the convenience of his own friends, if not for the gratification of his master; and he must have "his perquisites," that is to say, the privilege of robbing his employer of whatever he requires, or he is not content. Save us from a professional head-gardener, if ever we have a larger establishment than we can manage; for any man who will carefully look into the matter, will see with half an eye that an industrious man who has never seen a gentleman's garden, who has been all his life in a market garden, or even in a cottage garden, will produce as much really useful fruit, vegetables, and flowers, and be a more useful man, and a better example, than any who have been cursed with a service. Many of the horticultural and botanical gardeners are contaminated by the examples constantly before their eyes in a gentleman's establishment.

4. *The gentleman has to supply the gardener's friends.*

According to the connexions of the professional gardener, so does he dispose of what he calls the surplus produce of the establishment. The surplus produce meaning, however, the "first fruits," the best specimens, the largest quantity, the picking of the garden over which he governs; and he takes the great-

est care of those subjects which bring the largest price, or are thought the most valuable. If a gardener has a family of his own, and lives away from the premises, his house is better supplied with fruit and vegetables than his master's. If his friends or acquaintances be numerous, he takes care of them; and if he have no friends nor acquaintances, he finds customers. But with regard to the employer having to do it, the cunning gardeners contradict the inference, though they admit the fact; they say, "If my master wants a dozen cabbages a-week, and I supply him, what is it to him if I grow a dozen for myself—it makes no difference to him." We confess, we cannot see with the same eyes. To grow twice the quantity of a thing, costs twice the labour; it may not in the simple article of cabbages seem so, because it may be said, "While you are planting out, what is the object of putting out a few more?" But although the object may seem trifling, it is proving what we say—it takes twice the labour. If a man has half a day's planting for the family use, he is at liberty the other half day; but if he has to occupy the other half day for the gardener's crop, there is the item completed, and the fact proved. But it is not in cabbages that the gardener lays out his master's time and material; it is in choice subjects, forced subjects, dear subjects. If a one-light frame would supply his master with all the cucumbers he wants, it requires a three-light frame to make up enough for the gardener's use, and the use of his friends and acquaintances. Now here comes an outlay worth taking account of. If the dung is worth ten shillings a load—which in some parts of the country it is—one load would do for the master, but there must be three for the gardener and he together. If a one-light frame of forced asparagus be enough for the family, there must be three, to provide for the gardener's friends and acquaintances; and here we have the same important addition to the cost. If forced kale, forced rhubarb, mushrooms, and various other matters, are trebled in quantity at the cost of the master, the gardener claims the two-thirds increase as his perquisites; and nobody will question the fact, that if the produce is the gardener's to give away, it is the gardener's to sell; and without caring for anything that may be said to the contrary, we here affirm that such is about the proportion that in all places owned by ignorant or careless moneyed employers, the gardener takes for his share. How, then, can the gentry wonder at the costs of a garden establishment? The gardener, who is always giving away the finest fruits and vegetables, is always receiving something in exchange;—the consideration not always very moral, not

always very creditable; but when anything is purchased by robbing an employer, we must not look very nicely into the nature of the return. One thing is quite certain, and that is, there is no possible check without a system of very discreditable espionage; and a gentleman had better discharge those that want looking after than employ people to watch them.

5. *Sometimes the gentleman supplies the market.*

It is not many months since the *Gardener's Chronicle* admitted a letter in which practical gardeners were accused of robbing their masters of the best fruits and vegetables, and selling them to the people in Covent Garden market. The foulness of this libel on the practical gardener was in the application. It was written most likely by a man who had been robbing his employers from the moment he set his foot in a place that offered the opportunity; and the only fault was in attributing the villany to the class of gardeners who were undeserving the imputation. The gentlemen gardeners who were above work, and lived and saved money by thieving, would have been rightly enough accused, but the working gardener, the practical man, the man always in his business, and master of it, was the last upon whom the imputation could be fairly laid; and never was the old truism, that "the biggest rogue cries out first," more completely confirmed. There was no libel had the accusation been laid at the door of the right men—the men who had been contaminated in the various horticultural and botanical establishments of the kingdom, where thieving is instilled into the mind by starvation wages, and idleness by the want of proper employment. Never was accusation more true, if applied to the generality of the "birds of that feather." That gardeners do supply customers is certainly true. That some of the finest fruits and forced vegetables that reach the first-rate fruiterers and greengrocers in town and country, are stolen by the gardeners and sold, nobody can deny. Those who give away to friends, and chop away produce for favours, would indignantly spurn the idea of selling it; the idea would be offensive; but the gardener who thinks hard money better than exchanges of favours, and who prefers lucre to the fame of being generous, is not one jot more dishonest than his proud neighbour who scorns money. We are quite aware that there are times when the gardener cannot spare for market; a scarcity, or an increased demand in the house, or the unexpected influx of visitors, who run all over the grounds, and almost covet every production worth having, besides devouring a good deal more than is at all agreeable to the gardener, may lessen his opportunities; but he will send all he can, and

if the family be not present, this is occasionally a good deal. His excuses about short crops do as well for the family as the fruit shop.

Our neighbouring acquaintance was head gardener to Mr. —, who was in parliament, and he used to receive a box or basket once a week containing whatever delicacies my friend could send that were worth the carriage. He used to force grapes, and, as there was always a goodly crop, he had a tolerable supply : and when they first came in, the gentleman used to give weekly parties, for which the best collection the place afforded used to be made up, and we have occasionally helped ; but the gentleman's basket was not the only one that was sent to London. The gentleman gave a large party on one occasion, and his grapes were scantily supplied, so that having made a great display in general, he felt obliged to go to the fruiterer's. Covent-garden supplied nothing good enough to go with his own, and he hunted among some of the best west-end tradesmen. He found some as good as his own, and purchased, at a large price, as many as the man could spare ; for the man told him that one regular customer took a certain quantity all the while they were in ; " but," said the man, " I will get you more next week ; I will write to — for an additional quantity." At the name of the place, of which his own establishment formed by far the larger portion, he was struck, and then inquired farther, not directly, but in a rambling conversation about the splendour of the fruit, who else sold any of it. " Nobody," said the shopkeeper, " I have contracted for all the crop, and I have sold to one person so many pounds per week for the next six weeks." Mr. — sent down his London steward with directions to eject our friend at a minute's notice, to search his cottage and boxes before he removed anything, and to stay until a gardener came to take possession ; in the mean time to make the under-gardener do the work, pack up the grapes as usual, but to direct all, instead of a part, to the family in town. The under-gardener pleaded ignorance of everything, but while debating about the matter, the empty box from the London fruiterer was left as usual, with, though it sounds rather Irish, a note enclosed, ordering a double quantity. The under-gardener was dismissed for his pretended ignorance, and in consequence of a note sent by the steward, the new gardener came, accompanied by three or four hands, and before the week was out, only two of the old hands remained on the premises. Our friend the head-gardener did not try for another place ; he had saved money enough to retire upon, though the highest wages he ever received, if he had always had them, and all saved, would have required ten years more time to

have accumulated to the amount he had in hard money.

Although this anecdote is curious, so far as it relates to the discovery of a fact, the transaction is as common as digging. There is hardly an establishment of any note, where the owner is ignorant of gardening, and careless of expense, but what the system goes on. It is as common to the professional head-gardener, as cutting a cabbage for his own pot. Nobody could begrudge a gardener all the vegetables he can consume in his own family, though they may think the employer should have the best ; but the notions of right and wrong must be very loose when a gardener will attempt to justify a distinct systematic robbery, which in any other servant would be set down as a felony. It is, however, a great fact, that a large portion of the finest fruits and vegetables that find their way to the best tradesmen, are the produce of gentlemen's gardens, and therefore come cheaper to the tradesman than if he purchased all he sold of the regular market-gardeners. The *Gardener's Chronicle's* charge against practical gardeners as a class, was a libel ; but as applied to some of these professional gardeners, who have been initiated into all the habits of idleness and vice engendered in public establishments, where the men have not enough to live on honestly, it is perfectly and unanswerably true.

6. *The gentleman has to pay for what he does not have, as well as for what he does have.*

One of the modes of thieving too commonly adopted is by collusion between the tradesman and the gardener, by which the master is charged for a larger portion of goods than come on to the ground. Tan, dung, loam, peat, mats, coal, coke, breeze, and many other things, are usually supplied to the order of the head-gardener. Ten tons of coal, ten loads of peat, tan, &c., are charged in the tradesman's bill—eight came, and the bill is made out for ten, signed by the gardener as correct, accredited by the steward, the tradesman paid. The proportion in which the surplus is divided between him and the gardener, is a matter of private arrangement ; in the cases which I have known, the tradesman has one-third and the gardener two-thirds. This trick came out by accident at a place within twenty miles of London. Two coal sheds adjoined ; one was for the use of the house, the other for the garden. The garden had always been supplied by one man, and the house by one of the tradesmen who supplied bread and flour. The new butler had to set the men to heap up the coals to make the place hold the lot, so that the door might be closed. The garden coals came in a month afterwards, but the cellar was not so full as the house cellar, which had been in use for

weeks. It was mentioned to the steward, who instantly sent for the coal merchant's men, then a good way on their road, with orders to return. There were the right number of sacks, but nobody had counted them on being emptied; the men were questioned, they insisted there were ten tons, and that they had emptied all the sacks that were then lying in their waggons. However, there was no getting over the fact, that six weeks' consumption from the ten tons for the house had not reduced the coals to nearly what were deposited for ten tons for the garden. They were weighed next day;—one ton and a half deficit, the coals sent away, the dealer dismissed, and, to save himself, he told the tale. He had done so with the former gardeners, and had been told that unless he did so he would lose the custom. The same gardener had no chance of doing it again in the same place, for he was discharged. But, though many may feel indignant at the imputation, it is so common a trick among those resorted to by servants to rob their masters, that the tradesman ought to be looked after in all establishments by persons unconnected with the ordering or paying. It would soon be found that the expenses of large establishments would be considerably lessened, and that servants would not so soon be able to take public-houses and shops, and embark more capital in a speculation than their whole wages would have amounted to, had they been paid all their lives, and not expended a shilling. There is not a more common trick than having bills made out for different quantities, that the persons whose gift the orders are supposed to be in, may reap the fruits of their knavery without suspicion, and be praised for their exactness and their constant production of vouchers for every shilling, when these very vouchers are the forgeries by which they defraud their employers; forgeries, because they purport to be true bills and receipts when they are false ones. Here and there we may find exceptions, but we have seen fourteen or fifteen places as under-gardener or foreman, and it prevailed more or less in all, and in some it went right through the departments; for even the carman who removed heavy things was obliged to give his five per cent. at settling, and had to make out his bill for more loads than ever came into the garden; so that the proprietor of the establishment actually paid for many things and much service that he had no benefit of in any part of the establishment.

Having gone through six of these important points, we come to one which requires a whole paper devoted to it, we mean, the assertion that gentlemen often have things out of season which are not worth the expense that

must be incurred, and make an excuse for much more that need not be incurred.—A gardener is always glad of authority to do expensive things, for the reasons we have mentioned. They like expensive planting, because they apply to nurseries for the shrubs and trees, and the more they lay out, the more will be their commission. They like building of pits and houses, because the builder has to give them their per centage. And they delight in having to force things, because the means have to be provided, and besides these means adding to their means of working for themselves, produce from all the parties employed the perquisites of the gardener. A gentleman wishes for cucumbers in January, for cherries in May, for peaches, nectarines, and apricots long before their time. The gardener says they can be done. He gets leave to have the "trifling alterations," or the "small houses," or the something else that may be necessary for these things, and the gentleman finds half his income for the year absorbed by tradesmen's bills incurred by his gardener, who, in answer to any remonstrance, reminds him that he expressed a wish for this, that, and the other, and gave leave to have the necessary things done. In vain he says he understood there were no difficulties and not much expense; there the bills stare him in the face, and he is taken to the garden to see that the work has been done. He is eaten up with claims that he fancied he did not owe, and repents at leisure the mischief which he consented to in a hurry. But he has his cucumber as promised, for the gardener has taken care of that; and the cost of it, and of all he has out of season, may be reckoned for a long period at about a pound an inch. The management of a garden with all things in its season is not one-third of the expense that is incurred by any extent of forcing. A man may eat cucumbers from March to the end of the summer for the price of the dung he uses, if his gardener be content with an ordinary hot-bed; and the dung is worth all it has cost after it is done with for the bed. Anybody may have peaches, nectarines, plums, cherries, all the best apples and pears in abundance, for little or nothing, if he be content with them in their proper season; and if he wishes them out of season, he had better buy them at the most extravagant price than grow them himself. Under the management of an honest gardener, he may keep up his cold pits, his greenhouse, his conservatory and stove, without any enormous outlay, and especially if he will but make himself acquainted with some of the leading points in gardening; but to do as some of the gentry do, leave the management to the ordinary professional gardener, is

very little better than making ducks and drakes of his sovereigns where the waters are too deep to recover them. One man can keep an immense lawn, shrubbery, and flower garden, in first-rate order. One man to manage and another to assist, can keep up an excellent supply of fruit and vegetables of all kinds in season, and some a little out of season. One man and an assistant can manage a good many plants under glass. But forcing involves an outlay to which there is no limit; it places a man's purse and credit at the mercy of his gardener. He is swimming out of his depth; he knows nothing of his affairs. He is always being pestered for money,—money; money for goods that he never sees, and from which he has very little advantage. With good management, and a practical man at the head of the garden department, a very superior establishment can be kept up with five men, an establishment very superior to many that cost from seven hundred to a thousand a-year; and two or three acres in lawn, kitchen garden, and orchard, would be within the means of hundreds who rather let their gardens than incur the extraordinary costs which never fail to come down upon those who employ a professional head-gardener, qualified to be a gentleman, and live upon the perquisites which arise out of the impositions generally practised. We know we are treading upon very unpopular ground; we are quite aware that we should stand very little chance of a place under an ordinary professional head-gardener, were we known; but nobody seems very forward in exposing truths which we defy all the world to deny, and which almost every owner who looks at his accounts, and knows his garden expenditure, will collaterally prove by the enormous sums he pays, and the little value that is returned. What but this induces a man of substance to let his ground, instead of keeping up a garden establishment? What but this has led to hundreds of market gardens being appendages to mansions kept up "at a bountiful old rate," but denuded of their kitchen gardens because the owner can buy the best of every thing in and out of season at a tenth part of what they would cost him had he one of the "well brought up and well qualified" head gardeners to govern his garden establishment? Hundreds of gentlemen who have been quite sickened of growing their own fruit and vegetables, now let their gardens to those who supply the market or their neighbours, and among others the gentleman himself, without spending more for labour and materials in a year than the owner would have to spend in a month under some gardener's management; and we are quite assured that there is not in the kingdom a single garden establishment under a regu-

larly brought up head-gardener, that, by the removal of the evils we have mentioned, might not be carried on at one-half the expenditure, and in many cases still less, that they now cost the owners. We could write hundreds of cases to prove the truth of our averment, and it may be necessary hereafter to mention a few establishments remarkable for all the leading features of which we have complained. Suffice for the present that we strongly recommend, first, those who are fearful of garden expenses, and will not incur any; secondly, those who already feel them severely; and thirdly, those who never look into their affairs at all,—to take advice of several practical men before they are many months older. For the first may be shown that a garden ought to be an actual saving instead of an expense to a family; the second may be relieved of from one-third to two-thirds of their expenses without being worse served; and the last will discover that a frightful amount of the money he expends goes to make the gardener and his principal assistant gentlemen, though according to tradesmen's bills every thing may appear correct and straightforward.

[Although we have allowed our corresponding "Retired Under-Gardener" to speak for himself, we cannot agree with his statements as applied generally; we are quite prepared, however, to admit many of his charges as applicable to individual cases, but we believe these to be the exceptions and not the rule.]

FLOWERS AND ORNAMENTAL PLANTS OF THE INDIAN ISLANDS.

NATURE has scattered her richest gifts broadcast over the surface of the Eastern Archipelago. There is no form of magnificence and beauty under which she does not there present herself, from the quiet loveliness of the secluded valley to the grandeur and sublimity of an Alpine landscape. Mountains and forests, jungles, prairies, and cultivated lands, hills, valleys, and streams, are met in succession as the traveller pushes his advance across the interior provinces of those little-known countries, which have been termed the group of Twelve Thousand Islands, from their multiplicity, and the vast space of sea which they stud.

To others we leave the animals, the agriculture, the minerals, and the geography of the Indian islands; our province is to describe, as fully as is consistent with the present state of knowledge on the subject, their floral beauties, various and magnificent as they are. "You breathe," says an old author, "in the Eastern Archipelago, an air impregnated with the odours of innumerable flowers of the greatest fragrance, of which there is a

perpetual succession the year round, the sweet flavour of which captivates the soul, and inspires the most delightful sensations;" language highly wrought and poetical, but yet not without its truth. The Indian islanders are passionately fond of flowers; their women are never considered dressed unless decorated with a profusion of them, and when any beautiful thing is to be expressed, the name of some flower is made use of.

The prevailing colours of all the floral race of the Eastern Archipelago are yellow and red, though other hues are also frequently met with. It may also be observed that some of the most magnificent of the Indian flowers are the produce of large trees, though a considerable number grow on shrubs and humbler plants, especially creepers; their perfume is generally oppressive and heavy when close, but at a distance the sweetest odours are given forth.

Borneo produces many gaudy and many elegant flowers; one specimen of the *Rhododendron* may well be termed gorgeous; it grows with its roots winding round the trunks of the forest trees, and bears large heads of flowers, sometimes eighteen in a cluster, of various shades, from a pale but rich yellow, to a reddish salmon colour, which in the sun sparkles with the brilliancy of gold. There are four other species of this plant, crimson, red, and a mixture of the two.

The *Clerodendron* is a shrub ten feet in height, having at the point of every branch a loose sheath or spike of rich crimson flowers, projecting two or three feet from the foliage. The stems are red, while in the centre of every flower is a pure spot of white, the whole forming a magnificent pyramid. When the *Clerodendron* has done flowering, there remain on every stem four seeded berries, of a dark blue colour, which, combined with the crimson stalks, cause the plant to remain scarcely less gaudy than before. There are also different species bearing white and scarlet flowers.

The *Bringa Kasihan* (*Coclogyne*), or Flowers of Mercy, are highly fragrant, and of a delicate white or orange hue. A gigantic specimen of this plant has been introduced by Mr. Hugh Low into this country.

There are many beautifully blossoming flowers which grow abundantly on the banks of the Bornean rivers, among which is one (*Bignonia*) very fragrant, having a white fringe around it.

Of climbing and creeping plants Borneo produces a great abundance, among which is a species of *Bauhinia*, totally new and undescribed. When in full blossom it bears luxuriant clusters of gaudy crimson flowers. Another (*Hoya imperialis*) has been found

loaded with bunches of purple and ivory coloured blossoms; while another, which has been named after the Earl of Auckland, is hung with rich bunches of the most magnificent size and richness of hue. In the woods of Borneo many beautiful parasitical plants were seen by Captain Mundy, some of them, adorned with lovely blossoms, completely wrapped themselves in close thick matted folds round the supporting trunk, which they continued to encircle until it perished in the treacherous embrace, and mouldered to a heap of fat vegetable matter.

Eight different species of the pitcher-plant have been discovered among the Indian islands; that named after Sir Stamford Raffles grows on the rocky islands in the neighbourhood of Singapore, and never exceeds five feet in height, while the *Nepenthes Hookeriana*, found in Borneo at the bottom of deep jungle valleys, climbs to the summit of tall trees. Some of the pitchers hold a pint of water; the leaf hangs downwards, and is furnished with a strong rib, from which the curious formation which has been called the pitcher depends; a column runs up the back of this and supports the lid. Two species have been observed; one, dark green above and reddish peach coloured beneath, while the other is a green spotted with crimson.

Another species has been discovered (*Nepenthes ampullacea*), which is also a climbing plant; the stems, however, by degrees, drop from the supporting trunk, and moulder on the ground, when they are covered in a short time with vegetable matter, which forms a coating of earth about them; from this spring many shoots, which in time become new plants; and the spot of ground is thus gradually covered with a carpet, as it were, of these curious formations, over which are scattered a number of the pitchers, which, as the leaves gradually develop, wither and disappear, when the plants begin to flourish luxuriantly and climb into the trees. Mr. Brooke, in his new work,* describes a beautifully flowering plant, covered with abundant clusters of yellow and red berries, which he wished to transport to this country, but probably failed.

Herbaceous plants abound on the exposed and damp roads of Borneo, while in mossy places two species of *Anæctochilus* have been found, the one with golden coloured leaves, and the other still more beautiful.

The English Rajah of Sarawak has a garden in front of his house, where a profusion of the jasmine and *Camellia japonica* diffuse the most delightful perfume around; indeed, his taste

* "Narrative of Events in Borneo and Celebes, from the Journals of James Brooke, Esq.; together with a Narrative of the Expedition of H.M.S. Iris, by Captain Rodney Mundy."

seems to be in all cases guided by a strong attachment to flowers and sweet smelling shrubs, which he seizes on every occasion to enjoy and describe. Captain Mundy also seems to luxuriate in the odoriferous plants of the river banks of Borneo.

Among the different islands of the Indian Archipelago there appears to be one universal custom,—that of cultivating certain flowers to plant in graveyards. On the banks of the Mam-bakut river were observed many picturesque tombs erected on posts and surrounded by creepers and flowering shrubs. In Java there is one plant cultivated for no other purpose than that of adorning burying-grounds; it is called the Samboja (*Plumieria obtusa*), and has dark leaves, with flowers white without and yellow within. From its peculiar and solemn appearance, it always looks ancient. There is also another flower, the Sulasi (*Ocimum*), with a strong aromatic odour, which is gathered in large quantities to strew annually over the graves of great and famous men. In some islands a certain small delicate white blossomed flower is never seen but at the head of a new grave, where it flourishes for twelve months and then withers, never to be renewed.

Sumatra is an island famous for its ornamental plants, among the foremost of which we may mention the Canango, a tree of the largest size, which bears a profusion of greenish-yellow flowers, scarcely distinguishable from the leaves. They open only at sunset, and on a calm evening diffuse a pleasant fragrance, which affects the senses at the distance of many hundred yards.

The Choompaco grows in a regular conical shape, and bears many small tulip-shaped flowers, with a strong but agreeable scent, which are worn by young men and women when they want to be remarkably smart. Another superior species of this flower, which bears the same relation to it as the carnation does to the common pink, is the Sangelappo, a pretty shrub with green pointed leaves and magnificent white flowers.

The Boongorio, the Pandan, and the Melattee, are all handsome shrubs with fine flowers; the latter is always planted near houses.

The Tanjong is a tall tree with rich dark foliage, out of which peep innumerable star-shaped flowers of a yellowish white, with a scent exquisite at a distance but too powerful when brought near. Wreaths of them are much worn by women.

One flower, the Soondal Mallam, or Harlot of the Night, is remarkable as blowing only long after sunset. The Geering-landa, is a papilionaceous flower, so called from the circumstance of its seed rattling loudly in the pod, "geering" signifying a bell: "landa"

means "hedgehog," to the spines of which animal, the blossoms are often found adhering. At Malacca is found a curious flower-bearing tree, called the Tree of Morning, whose blossoms open at sunrise, and close in the evening. Further than this, there is no description anywhere of this tree.

The Tabcong-broo, or monkey-cup, is a rare monopetalous hollow flower, with a lid at the top, which remains open until the bell, as it were, is filled with water by the rains or dews, and then closes. When a fresh supply is needed, the valve re-opens.

There are many other remarkable flowers in Sumatra, which we cannot allow ourselves space to particularize, though we may mention the scorpion plant, which is singular and remarkable. Its shape very much resembles the insect from which it takes its name, and that part which we may call the tail has a strong odour of musk.

In one of the Dinding islands, which, though not properly forming part of the Archipelago, yet lie in the Indian seas, Mr. Finlayson discovered a new species of *Epidendrum*, of gigantic dimensions. The flowering stem was six feet long, and had upwards of ninety flowers on it, each of which was between two and three inches across, and four inches long, of a rich yellow colour, specked with brown, and emitting a pleasant fragrance.

Jasmine wreaths are used by many tribes of the Indian islanders to decorate the coffins of the dead, and are supposed to signify a pure and innocent future state.

Celebes luxuriates in an abundance of the floral creation. Its mountains are covered with wild flowering shrubs, its valleys bloom with the most delicately blossoming creepers, its broad soft meadow lands are lavishly ornamented with beautiful plants, its forest trees are clothed with lovely parasites, and its extensive lakes are described by Mr. Brooke as presenting the appearance of vast beds of the most brilliant water-lilies; presenting a contrast of sweet white flowers and dark green fresh looking leaves, among which are found the nests of aquatic birds, which are continually seen running over or swimming amid the flowers. Among the mountainous districts, where, in the repose of secluded little valleys, the processes of agriculture are carried on to a great extent, gardens are found decorated with trees hung with beautiful blossoms, while shrubbery clothes the gentle slopes, and scents the dells and hollows with exquisite fragrance.

In Java there is a large plant called the Flower of the Lake, which grows in pools and standing waters. It has a stalk six feet high, with broad leaves, and flowers resembling the tulip, though twice as large, with wide pointed

petals of various colours, bright green, white, primrose, and rich purple. When first budding, the blossoms emit a sweet fragrance, which, says a traveller, by reason of its pleasantness attracts all that pass by it. When the flowers are fallen off, there appear large pale yellow pods, containing some thirty bean-shaped seeds, which are sold as an edible in the markets of Batavia. The true name of this plant is not known.

The Shoe-flower, so called by the old Portuguese merchants from the juice of its leaves affording an excellent shoe blacking, in appearance much resembles the pæony so often seen in our own gardens. There is a male and female flower, both of which are fringed with smaller leaves at the top of each petal. A third species grows on a small bush like the sweetbriar; its flower is shaped like a coronet, with a bright ruby spot in the centre.

The Flower of the Bush has dark green leaves, with clusters of orange coloured blossoms, and is found in almost every bush or hedge-row in Java. Another plant widely distributed over the surface of this island is the Saffron flower, from which a tincture of that colour is extracted.

The Betong tree produces pale blue flowers like those of the rosemary, sometimes a thousand in a cluster. A decoction of this plant is used medicinally by many Malayan tribes. About Batavia grows a tree of a curious appearance. The stem is very thick, and sends forth green sprouts which produce flowers somewhat resembling a red lily, which hang in heavy bunches, among masses of foliage scarcely less beautiful. The inhabitants of this city seem fond of flowers, as they plant many hedge-rows of jasmine in every direction outside the walls.

In the recesses of those vast forests which clothe so large a portion of the surface of the Indian islands, we occasionally pass under avenues of trees often rising to the height of a hundred feet before casting out a single branch, and adorned by every variety of satellite and creeper, which, uniting and clinging together, form vast festoons of various colours,—crimson, yellow, purple, and other variegated hues, which depend in beautiful arrangement from the branches, or sway to and fro under the influence of the wind. Round the rocks, flowers and shrubs, fragrant and gorgeous, add their brilliant colours, while the greensward revels in a luxury of pretty wild blossoms.

On one island of the Archipelago group, a traveller describes some flowers "beautiful to the eye but without smell," growing among beds of pumpkins. Of them, however, we have seen no late description, though, from the author's known veracity, we are inclined to believe the account.

Balambangan, an island on which we once founded a colony, produces a large timber tree, with leaves like those of the bay, and flowers extremely beautiful and odoriferous. Here also are found various species of the Nepenthes or pitcher-plant, and also a pretty plant which yields a large quantity of gummy water.

The Philippine islands produce an abundance of ornamental plants, which, however, all grow wild. The first mention must be given to the Sampagas, in shape like a little white rose, with three rows of leaves, with a sweet smell like the jasmine of Europe. Then comes a similar plant called Solasos, with a pleasant scent; and also another, with an odour like that of fresh young clover, named Locoloco. Pansiman is a tall plant with a delicate white flower, used by the natives as an outward application to heal the wounds occasioned by poisoned arrows, spears, darts, &c.

Lotuses abound in all the standing waters of Java. Whenever the traveller reaches the borders of any little lake or broad pool, he may be sure to see it brilliantly decorated with these elegant flowers. Java, indeed, luxuriates in sweet smelling and ornamental plants. In the language of that island, "flower" is the only term used to express poetry, or a beautiful woman. Public places are often profusely decorated with the rarest ornaments of the floral creation. One flower, the Malati, is cultivated extensively as an article of commerce. It bears a small white blossom, but to what use it is applied is unknown. A large herbaceous shrub, with pinnated leaves, and a pretty bright yellow blossom, is used by some of the islanders as a cure for the ringworm. It is considered an effectual remedy.

The Lagoondée is a plant which shoots up many tall slender stems. It bears numerous monopetalous flowers, sometimes peach-coloured, sometimes pale blue. The leaves are deep green on the inside, and whitish on the back. They are esteemed as a fine antiseptic. Geambée is a monopetalous purple flower, which grows in tufts. Succoodoodoo is a plant resembling the wild rose, with a delicate perfume.

There is a pretty, rosaceous, crimson flower, found in many of the islands, but chiefly in Sumatra. Under the blossom is a long tube of the same colour, clothed with a growth of a long purple hair-like material. This is not much known to botanists, if at all. The Daoup is a white, homely flower, with a faint smell. The most remarkable feature of this plant are its leaves, which are curious, being double, as if two were joined together, and folding with a hinge. The scientific name has not yet been discovered.

Nearly all nations when they wish to select an emblem to convey the idea of purity and

delicacy, make use of some small white, or at least pale blossom. Accordingly, among the Indian islanders, chaplets of white flowers, with pleasant perfume, are twined in the hair or bound across the forehead. In Java and Sumatra, especially, this practice obtains. The beatitude of a future life is expressed by strewing the resting-place of the dead with delicate blossoms, fresh culled by the hand of affection; the happiness and purity of married life are denoted by decking the person of the bride with garlands of white flowers, and pale fragrant blossoms are emblematical of whatever is beautiful or good in this world.

One custom of the Indian islanders we have not often seen remarked on. Among the inhabitants of Teenghor, when a man dies, after many ceremonies have been observed, an image of leaves made to represent the human form, and of about a cubit high, is prepared and placed in a conspicuous position. A garland is twined around it, and in front is placed a pot of water. After many days have elapsed, the chaplet is burned, and no more notice is taken of the dead, until the expiration of a thousand days, when, if his memory be loved and cherished, the ceremony and the feast are repeated.

Among some of the ornamental plants of the Indian islands which we have not as yet particularized, is the Coral tree, which puts forth abundant clusters of large crimson flowers. There is also a tree called the Tcham-paca, of which there exist two varieties, the one bearing red, the other yellow flowers, of exquisite fragrance. Among the innumerable flowers which bloom in perpetual succession, are the Champaka, the Tanjong melatikana-nega, the Magaseri, and many others, of which we have as yet no accurate and scientific description, but which are all of a showy and elegant appearance, and remarkable for their sweet odour. They are much used by the natives as ornaments. The myrtle and the rose are found in Java, in the gardens of the European settlers.

The *Camellia japonica* flourishes everywhere in Borneo, in the most luxuriant wildness. Every European settler's garden is adorned with this graceful flower, while in the loneliest spots it is found in every variety.

We now come to describe a gigantic flower, discovered by Sir Stamford Raffles while on a journey to the Hill of Mists, in Sumatra; and named after him *Rafflesia Arnoldi*. It is perhaps the largest and most magnificent in the world; and is quite distinct from any other flower. Across, from the extremity of each petal, it is rather more than a yard; the nectarium is nine inches wide, and as deep, holding a gallon and a half of water. The whole flower weighs fifteen pounds. This

giant flower, the native name of which is *Petrum Sinkinlili*, or, the Devils' Betel-box; is generally found in the forests, parasitic on the lower stems and roots of other plants. It appears at first in the shape of a diminutive round ball, which by degrees dilates to a great size. The flower-bud is invested by numerous membranaceous sheaths, or plates, which surround it in successive layers, and expand as the bud enlarges, until at length they form a cup round its base. These sheaths are large and firm, and dark brown in colour. The bud, before expansion, is depressive, round, with five obtuse angles, and of a deep red. When fully expanded, this flower may well be termed the wonder and glory of the floral kingdom. It forms a broad deep cup, capable of holding twelve pints of water. Inside, it is of an intense purple hue, more or less marked with yellow, with soft flexible spines of the same colour. Towards the mouth are numerous depressed spots of the purest white, which appear strongly in contrast with the deep rich purple of the surrounding substance. The petals are of a brick red, with numerous pustular spots of a lighter colour. Nor is this flower a tender fragile thing, likely to be blown away by the breeze. The substance of its petals is not less than half an inch thick, and of a firm fleshy consistence. Soon after expansion, it begins to give out a smell like that of decaying animal matter. The fruit never bursts, but the whole plant gradually rots away, and the seeds mix with the putrid mass. This flower is almost unknown to the natives of its indigenous country. Very few accounts of it, indeed, have reached this land of inquiry and research, of science and thirst for knowledge. This flower takes three months from the first appearance of the bud to arrive at maturity. It is generally seen clinging to the roots and lower stems of those gigantic creepers which are everywhere seen in the forests of Java. Sometimes they climb the trunk of some majestic tree which towers to the height of a hundred and ninety feet before throwing out branches, and then drop to the ground like a huge cable, along which are seen darting the squirrel and the monkey.

Another flower growing in many of the islands in the Straits of Malacca is remarkable. It also grows parasitically on rocks and tree trunks. The stems are as thick as a man's wrist, and six or seven feet long, without branches, and at the extremity produce abundance of leaves. But the most extraordinary feature of it is its magnificent inflorescence, which forms an erect *spike six feet high*, with upwards of one hundred large spreading brown and white chequered fragrant flowers, between two and three inches in diameter.

Among the ornamental productions of the

Indian islands, the clove tree is not the least remarkable. It grows in the form of a pyramid, its branches sprouting forth close together. It is as large as a cherry-tree, but more resembles the laurel. In the midst of each leaf is a large vein which sends forth many lesser branches; these leaves grow on long stalks, sometimes single, but for the most part in clusters; those that grow near the extremities of the branches are of a purple colour, but the rest dark green; if they are rubbed between the hands they scent as strong as the cloves themselves, and so do the branches. On the extremities of the branches grow many sprouts which produce buds, from which spring the flowers which at last produce the knot. The blossom is white at first, not unlike our cherry blossom, each leaf of the flower having three small streaks; they then turn green, afterwards red, and last of all dark yellow inclining to black. A cluster of these trees affords a very agreeable sight.

The Schageri Hottam produces flowers which grow in clusters on small green stalks, and consist of four or five huge yellow leaves with little or no odour.

The Kudaharih is twelve feet high, and bears large red bell-shaped flowers.

The Mandaru is a tree with a trunk a foot thick. The flowers have five oval petals, the centre one of which is largest and broadest, and somewhat round in shape, white on the outside and purple within. The other four are pale red without, but deep red within. In some of the flowers a pale blush of rose colour is only observable inside, while others are crossed by streaks of a blood-red hue.

The soil about Batavia is so rich that flower seeds brought from Europe, Persia, and Surat, thrive exceedingly, though it has been remarked of English plants that, though they will flourish well and become covered with flowers, these latter dwindle soon and lose their scent.

The Button flower, so called from its resemblance to that little article, grows in abundance in the gardens of Java. Its purple colour remains long after it has been dried up and withered by the sun. The white sweet-briar also flourishes plentifully, and bears leaves and flowers like our rose-tree, except that the flowers, which are very white, are not quite so large, and have somewhat pointed leaves. The scent is precisely that of the English rose. A great quantity of odoriferous water is distilled from these flowers.

The Siampin, or Flower of Cambojá, so called from its having been introduced into the Indian islands from that country, grows in all the gardens about Batavia as knotty trees about twelve feet in height. It bears no seed, but thick oily leaves, white at the extremities, but pale yellow towards the stalk, with red

spots on the upper side. The flower sprouts forth at the end of the twigs in a broad knot, and somewhat resembles our May, though of a much more striking aspect and not nearly so sweet a smell.

There is another flower very common in the gardens of Java, the Korban. It is borne by a tree somewhat resembling the palm, but generally taller and with larger leaves. The flowers sprout out of pale green buds, and have thick, oily, snow-white leaves, with yellow seeds in the middle. These flowers are in great request for their pleasant odour, and are sold in the markets of Batavia for about twopence English each.

The Devil's Leaf, so called from its springing up on any spot where a seed is cast, grows very fast. It has large green leaves of a brown and red colour. On the top sprouts out a bunch of green buds, which, opening by slow degrees, produces yellowish flowers. These having faded, a fruit somewhat like a chestnut is produced, which is very good food.

The broad Nomerado is much cultivated for its ornamental appearance, though it does not strictly come under the head of a flower. It bears large leaves presenting a most brilliant and pleasing aspect, being streaked with the varied colours of the tulip.

In and near the city of Batavia grows a certain flower, both in scent and figure not unlike our chamomile flower, but whether possessing the same virtues is not yet known. It grows about a foot high with large curved leaves. The blossom, which is white, sprouts forth out of green buds, with double leaves, curved at the ends.

The flower called the Four Lights of Java comes out of small buds; not unlike in appearance a single gilliflower, but of a bright red colour. It consists of four curved leaves, which have curious curls or twists at the ends. The leaves are dark green on the inside and pale green without, heart-shaped, and streaked with stripes of various colours. It is cultivated as an ornament, but soon fades.

There is scarcely a lake or pool in Java where the water-flower does not flourish. It sprouts out of large long buds, is pale green without and white within, with yellow seeds. After blooming, its resemblance to the tulip is strong, except that the outer colour is green.

The leaves of the White Violet grow close within each other like our own flower of that name, from which indeed it differs only in colour and scent, being of a pure and spotless white, and emitting no odour except while wet with the dews of morning. The flower issues out of a pale green bud. The leaves resemble those of the peach.

In the deep and dark woods of Java, the

explorer often finds a plant as large as a red cabbage, the leaves of which are brown streaked with pale green, and curved. The flowers, which are white within and yellow without, open at sunrise and close at noon. When in full bloom they resemble a bell. There is a fable attaching to this plant, which the natives say intoxicate all who approach it.

There is a lofty tree which grows in many of the islands of the Eastern Archipelago, and is called by the natives Kananga. It bears dense masses of leaves of a parrot green colour, among which are seen countless bunches of bright yellow blossoms, which add much to the beauty of an ornamental plantation.

One flower is much used by the Indian islanders for weaving in garlands. It is called Champakka and is of the shape of a peach tree, bearing immense clusters of what resemble orange blossoms. Their scent is between that of a rose and violet, and so strong that it may be detected at a great distance.

The Benga Jappan delights in shady places. The stalk is a foot high, and bears bunches of purple and white flowers sprouting between the leaves.

The Marygold of the Indian islands has derived its name rather from its colour than from any resemblance to our flower so called. The leaves are dark green, like those of the apple-tree, but somewhat smaller. On the tops of the twigs sprout forth orange-coloured buds, which, opening, produce the golden coloured flowers with four leaves. They have no smell, and are only cultivated to please the sight.

Among all the flowers of the Indian islands none are held in more esteem by the wild races that inhabit them, than the Mogori. They are planted with great care in long well manured beds, with little walks between them. The stalk on which the blossom appears is about two feet in height, and somewhat resembles the sweet-briar. The flowers are of a brilliant white, consisting of four leaves, which seldom open, and possess a scent like that of the lily, but are no larger than apple blossoms. On holidays both men and women deck themselves with chaplets and strings of this flower, which are sold in the public places by slaves.

The Tree of Melancholy, so called from its never blooming but at midnight, produces dull flowers from which are distilled an odoriferous water. There is also another tree resembling the above, which blooms in the morning but is stripped of all its leaves by night.

From this brief sketch of the flowers and ornamental plants of the Indian islands, it will be seen that no part of the world produces a greater abundance or variety, from the gigantic flower discovered by Sir Stamford Raffles, to the delicate modest blossoms of the

Mogori, and the brilliant Four Lights of Java, all and each are beautiful in their turn. Nor are they confined to the gardens and ornamental grounds and shrubberies in the neighbourhood of cities, towns, and villages. The wilds of the forest are adorned with every variety of the floral creation. Doubtless many, as yet undiscovered, still bloom unseen,—

“Wasting their sweetness on the desert air.”

The loneliest Dyak of the woods can feast his eye and adorn his cottage and his person with flowers which many an English amateur would not think a fortune wasted in procuring. And where no human foot, save that of the savage ever trod, the tall trees are bound in the embrace of giant creepers, heavy with the weight of the most magnificent flowers, of the most brilliant and the richest colours,—purple and gold, yellow, red, and the variegated hues of the tulip. The atmosphere is often so charged with the sweet fragrance as to be unpleasant.

We have not attempted any botanical description, any scientific research into the natural history of the flowers and plants upon which we have touched in the present rambling paper. Our object has been rather to convey to the reader's mind an idea, however faint and inadequate, of the floral riches of the Indian islands. We have heard it remarked that Nature seldom throws her gifts of beauty and her gifts of utility together. However, this hypothesis has been demonstrated to be unfounded, at least in the Eastern Archipelago: there the timber-tree and the delicate blossom flourish side by side, the coal seam and the diamond mine are found in close juxtaposition, the buffalo and the bird of splendid plumage alike dwell in the forests of the Indian islands, whose floral creation is perhaps the most magnificent in the world.

PENTSTEMON LANCEOLATUS.

Pentstemon lanceolatus, Bentham (lance-leaved Pentstemon).—Scrophulariaceæ § Antirrhinidæ-Chelonæ.

Whether or not this plant exists in a living state in the gardens of this country, we do not know; it is, however, cultivated in Belgium, and, in its dissemination from thence, will no doubt reach England. Its introduction is desirable, not only on the ground of its ornamental properties, but also because of its nearly hardy character.

It is a rather strong-growing perennial sub-shrubby species, remarkable for being covered over with short viscous pubescence. The leaves are lance-shaped, and of a stout fleshy texture, and the stem terminates in a loose panicle of large showy blossoms, which

are tubular, the tube being considerably inflated, and divided deeply at the end into five lobes, two of which form the upper and the rest the lower lip; these lobes are bent backwards; the colour of the blossoms is a deep violet-purple, and they are profusely produced from August till the end of October. The form and arrangement of the blossoms will be understood by the engraving.



Mr. Hartweg appears to have been the original discoverer of the plant, and from his specimens it was described by Mr. Bentham. Hartweg met with it growing in stony places near Aguas Calientes, in Mexico, and from the same country it was introduced about five years ago to the garden of Mr. F. Vander-

maelen of Brussels. It is probable that it has already been grown in England, but if otherwise it will soon be obtained from Belgium.

The plant is not perfectly hardy, in this particular associating with the rare *P. Murrayanus*, which is also, as this is, liable to suffer in the winter months from the combined influence of damp and cold; the plants should therefore be housed for the winter in a cool greenhouse, where, for example, the more tender of the half-hardy plants now used for the summer decoration of the flower garden are preserved. At no time is it fond of much water, and in winter especially it ought to be very sparingly given, and at distant intervals; even in the summer, heavy rains are said to damage its roots, so that they should be protected as much as possible from their influence, much of which may be secured by planting it in sheltered and well-drained situations, or even upon sloping surfaces, where the excess of moisture would run off. As regards soil, any common garden soil of moderate texture will suit it, but of all others, a free light loam mixed with a good proportion of well decomposed leaf-mould is the most agreeable to it.

The propagation of these plants is not attended with difficulty, for they may be increased either by division of the plant at the root, by cuttings of the stems, or by seeds, which are generally matured. The seeds are best sown in beds or in boxes, and transplanted while young to the situation where they are designed to flower. The cuttings may be planted in sandy soil, under hand-glasses, choosing the weak, moderately young, side shoots for cuttings, and transplanting these also finally, as soon as possible after they are sufficiently rooted. The division of the plant is of course to be effected, either moderately early in the autumn, so that the plants may be a little established by the winter, or in spring at an early period, before they renew their growth.

NEW FLOWERS AND PLANTS.

FUCHSIA SPECTABILIS, *Hooker* (handsome *Fuchsia*).—*Onagraceæ* § *Fuchseæ*.—This is probably one of the finest of all the known species of *Fuchsia*: we state this from the inspection of detached portions, not having seen the entire plant. It has even been called the Queen of *Fuchsias*. The habit of the plant is erect and stout, and the stems grow from three to four feet high. The leaves grow in whorls of three, and are broad oblong, very firm in texture, and of a dark velvety green on the upper surface, while on the lower side they are mostly stained with purple. The

flowers grow singly from the axils of the leaves, and stand out nearly in a horizontal position; they consist exteriorly of a long slender tube thickening upwards, and nearly three inches long, divided at the end into four ovate-acuminate segments, which extend a little beyond the corolla; this part is altogether of a rich crimson-scarlet; within the calyx lobes are the four roundish petals, which expand so as to form a flattish face, of about an inch in width, and nearly circular outline; this is of a bright scarlet with a rosy tint; projecting just beyond the tube is a massive white

stigma, whose purity enriches the colouring of the other parts. Native of Peru on the Andes of Cuença. Introduced in 1847. Flowers in summer. *Culture*.—Requires a greenhouse; rich light loamy soil; propagated by cuttings planted in sand and placed in a hot-bed.

CASSELLIA INTEGRIFOLIA, *Nees and Martius* (entire-leaved Casselia).—*Verbenaceæ* § *Verbenæ-Casseliæ*.—A very handsome evergreen shrubby plant, with numerous smooth branches, furnished with ovate-lanceolate, entire, glossy leaves, and producing from the axils of those near the ends of the shoots, loose racemes of from four to six blossoms: the latter are funnel-shaped, with an irregular five-lobed limb, the expanded flowers being about three-quarters of an inch across; the colour is a delicate purple-blue, the throat pale, with deep purple pencillings. Native of Brazil, in woods. Introduced in 1843. Flowers in April. It is the *Duranta Fischeri* (Martius). *Culture*.—Requires a stove; peat, loam, and sand, with plenty of pot room; propagated by cuttings planted in sand and placed in moist heat.

ERIOSTEMON NERIIFOLIUM, *Sieber* (oleander-leaved Eriostemon).—*Rutaceæ* § *Boronieæ*.—A very fine shrubby plant, well adapted for cultivating as a specimen plant, and for exhibitions. It forms a close branching shrub, growing from three to four feet high, and furnished thickly with lanceolate pointed leaves, the flowers growing from their axils; the leaves are about the size of those of a broad-leaved myrtle, but rather longer. The flowers are star-shaped, formed of five spreading petals, the colour of which is blush-white tinged and tipped with pink; they are borne profusely all over the plant. Native of New Holland. Introduced before 1847, probably previously confounded with *E. cuspidatum*. Flowers in April and May. *Culture*.—Requires a greenhouse; turfy and sandy peat soil; propagated by seeds, or by cuttings planted under a bell glass in sand.

CAMELLIA JAPONICA, *var. Leda alba* (white Leda Camellia).—*Ternströmiaceæ*.—This is a handsome variety of this fine shrub, but the blossoms are rather thin. It is of good habit, having broad oval shining leaves, which are deeply toothed on the margin, and at the apex terminate suddenly in a point. The flowers are formed of broad rounded petals, notched in the centre, from eight to ten in the outside row; the ground colour is white with a slight yellow tinge, with here and there a rose-coloured stripe, the stripes vary in breadth, seldom occurring more than two on a petal. A garden variety. Received about 1844 from Milan, by Mr. A. Verschaffelt, of Ghent. Flowers in March. *Culture*.—Requires a cool greenhouse; loam and peat; propagated

by inarching or budding on the original species.

ACHIMENES ROSEA, *var. violacea Hoor-diana* (rosy Achimenes; Hoorde's violet-coloured variety).—*Gesneraceæ* § *Gesnerææ*.—A handsome free-flowering variety of the pretty *A. rosea*—one of the smaller flowered species. In the variety, the leaves are more coarsely toothed than in its parent species. The flowers are larger, and of a violet colour. These smaller habited Achimenes produce a great profusion of blossoms. A garden variety, raised in 1847 by M. Van Hoorde of Malines, being a cross between *A. rosea*, and a variety called *A. Ghiesbreghtii*. Flowers during the summer. *Culture*.—Requires a hot-bed or stove in the earlier stages of growth; blooms in a greenhouse; turfy peat and loam; propagated by its scaly tubers, by cuttings, or by leaves.

EUONYMUS FIMBRIATUS, *Wallich* (fringed-leaved Spindle-tree).—*Celastraceæ* § *Euonymææ*.—A fine evergreen shrub or small tree, not however remarkable for its blossoms but for its foliage. It has smooth roundish branches, furnished with ovate leaves, which are finely acuminate, and fringed with long parallel toothed serratures; the leaves have a very pretty effect among other plants in the early spring. The flowers are small, green, and inconspicuous, being nearly hidden by the leaves, which are rather large. Native of the East Indies, on the Sewalik mountains, as well as those of Shreenugur. Introduced about 1845. Flowers in April. *Culture*.—Requires the protection of a cool greenhouse; loamy soil; propagated by layers or cuttings.

ONCIDIUM GEERTIANUM, *Morren* (Van Geert's Oncid).—*Orchidaceæ* § *Vandææ-Brasidiææ*.—A very handsome epiphyte, of free habit, in the way of *O. bifolium* and *O. bicolor*, from both of which however it is technically distinguished. It is pseudo-bulbous, with roundish-oval compressed bulbs, bearing each a couple of leaves of a lanceolate figure. The flowers are large and rather strong, growing in a loose raceme; the sepals and petals are greenish, marked with small purple blotches; the lip is large and kidney-shaped, slightly notched at the apex, of a deep clear yellow colour, rendering the plant very ornamental. Native of Guatemala. Introduced to Belgium before 1847. Flowers? ——. *Culture*.—Requires a moist stove, not too warm; turfy peat soil; propagated by division of the plant.

MYOPORUM LÆTUM, *Forster* (gladsome Myoporum).—*Myoporaceæ*.—A tall pyramidal growing shrub or tree, very remarkable for its foliage, but not very showy in its blossoms. If the leading shoot is not destroyed, it grows rapidly, and erect, soon attaining considerable

height, and furnished in every part with numerous branches; the ends of the shoots are dark coloured and somewhat angular. The leaves are exceedingly beautiful; they are large, three or four inches long, of an oblong-acute figure, narrowed to the base, green, and dotted all over with distinct white spots, of the size of pin-heads, which, on holding a leaf to the light, are seen to be of a transparent texture. The flowers are small, white dotted with red, produced in the axils of the leaves, but completely lost among the foliage. It is worth introducing to a conservatory for the sake of its foliage. Native of the northern and central islands of New Zealand. Introduced in 1843 to the garden of the Royal Botanic Society. Flowers in the summer months. It is the *Citharexylon perforatum* (Forster); and the *Bastard Iron-wood* of the New Zealand colonists; the wood is remarkably heavy. *Culture*.—Requires a greenhouse; loamy soil; propagated by cuttings planted in sand and placed in heat.

CATTELEYA SPHENOPHORA, *Morren* (wedge-lipped Cattleya).—*Orchidaceæ* § *Epidendrea-Læliadæ*.—A very handsome epiphytal species, in the way of *C. guttata*, but differing from that in the lip being entirely without tubercles, and in some other technical matters. It grows with a short erect stem, having a couple of fleshy oval somewhat pointed leaves. The flowers are borne in a short raceme from the top of the stem; they are of a pale yellowish green, freely spotted with purple, particularly at the extremities of the segments; the sepals are of a lance-shaped figure, the two lower ones fleshy and somewhat arched; the petals are similar; the lip is three-lobed, furrowed, roughish, but without tubercles on its surface: the two side lobes are white, oval, blunt, and crisp, and envelope the column in the form of wings; the mid-lobe is white at the column, but beyond that it is purple, considerably lengthened, two-lobed at the extremity, these lobes being nearly square. Native of Brazil, whence it was sent from St. Catherine's to M. Verschaffelt of Ghent. Introduced to Belgium about 1845. Flowers?—*Culture*.—Requires a moist stove, in which the temperature ranges from sixty-five to eighty degrees; turfy peat soil, propagated by division of the plants.

SYMPHITUM PURPUREUM, *Gerard* (purple-flowered Comfrey).—*Boraginaceæ* § *Anchusidæ*.—M. Gerard has given a figure of this plant in the *Portfeuille des Horticulteurs* (Dec. 1847), but it can hardly be determined if it should rank as a distinct species or a variety of *S. officinale*. Schmidt separated from the common Comfrey, under the name of *S. bohemicum*, a plant with yellowish flowers, which is now called *S.*

ochroleucum; but the common plant varies with flowers white, blue, red, and violet, so that colour merely does not constitute specific distinctness. The present is a very ornamental perennial plant of the larger class; the stems are hairy, and winged with the decurrent bases of the alternate linear-lanceolate undulated hairy leaves. The flowers grow in pairs on double one-sided gyrate spikes, the tubular corolla being inflated, and of a purple colour. Cultivated in French gardens in 1847. Flowers in the summer. *Culture*.—Hardy; common garden soil; propagated by division of the plant.

PENTSTEMON LANCEOLATUS, *Bentham* (lanceolate-leaved Pentstemon).—*Scrophulariaceæ* § *Antirrhinidæ-Cheloneæ*.—A showy perennial plant, of stoutish habit, clothed with short viscous pubescence, and growing about three feet high. The leaves are lance-shaped and of thickish texture. The flowers form a rather loose few-flowered leafy panicle, at the top of the stem; they are large, and grow singly or sometimes three together, tubular, the tube being short and swollen, and expanding into a five-lobed limb; the colour is deep purplish-lilac. It is an ornamental species. Native of Mexico, near Aguas Calientes. Introduced to Belgium about 1844. Flowers in August. *Culture*.—Nearly hardy, requiring shelter in wet, or severe winters, when it may be kept in a cool house or frame; rich loamy soil; propagated by cuttings or by seeds.

CAMELLIA JAPONICA, *var. caryophylloides* (carnation-striped Camellia).—*Ternströmiaceæ*.—A strong growing and handsome variety of Camellia, with large broad foliage, and finely striped blossoms, which are about four inches in diameter, very double, and well filled up; the ground colour is blush, the petals being striped with much regularity, with deeper coloured flakes or stripes, which give the blossoms a very beautiful appearance. A garden hybrid obtained by Mr. Low, of Clapton. Raised about 1846. Flowers in April. *Culture*.—Requires a cool greenhouse; loam and peat; propagated by inarching or budding on the parent species.

RHODODENDRON JAVANICUM, *var. flavum* (pale Java Rhododendron).—*Ericaceæ* § *Rhododendrea*.—This species is an exceedingly beautiful evergreen shrub, with fine shining acutely oval foliage, and large terminal heads of blossoms. There are two varieties imported from Java; the one with coppery salmon-orange flowers, the other with flowers of an indescribably curious—but yet attractive—yellow colour, which is named *flavum*: both are extremely beautiful plants. Native of Java, growing both on trees and in the soil. Introduced in 1847. Flowers at various seasons. *Culture*.—Requires a good

greenhouse, or cool stove; turfy peat soil; propagated by grafting or inarching on the commoner species, on which it grows freely, notwithstanding its epiphytal character.

ALLOPLECTUS CONCOLOR, Hooker (whole-coloured *Alloplectus*).—Gesneraceæ § Gesneræ.—A rather pretty succulent-stemmed shrubby plant, growing about two feet high, and scarcely at all branched. The leaves are opposite, fleshy, smooth, between oblong and elliptical, acuminate at both ends, dark green above, and paler beneath, attached by a coloured petiole. The flowers grow from the axils of the leaves, several together, and consist of a loose red smooth spreading calyx, divided into five triangular waved segments, and a red hairy tubular corolla, which is attached laterally at the base so that the lower end, which is bulged out, forms a blunt spur, and is also bulged out at top, so that the small mouth of the tube takes a peculiar oblique direction away from that to which the base is directed; the lower part of the corolla is yellow. It is the *A. ericalyx*, of gardens. Probably a native of Brazil. Introduced in 1846. Flowers in winter. *Culture*.—Requires a stove; light soil, of loam, peat, and vegetable mould; propagated by cuttings.

ECHINOCACTUS CHLOROPHTHALMUS, Hooker (green-eyed *Echinocactus*).—Cactaceæ § Echinocactidæ.—A very handsome and distinct species of the beautiful family of dwarf Cacti. The plant is nearly globose, and grows in clusters, each being about the size of a small orange, and of a glaucous green colour. The surface is varied with about ten or twelve deep furrows, and each of the intermediate ridges is divided into six or eight roundish mammæ, at the top of which is seated a cluster of from seven to ten slender acicular spreading spines, from half an inch to three quarters of an inch long, the central one longer and stronger than the rest. The flowers are large, and grow singly from different parts of the top of the plant; the calyx is imbricated with numerous mamillary scales, a few of the uppermost of which become petaloid; the corolla consists of numerous spathulate petals, of a glossy purple colour, paler at the base, spreading, so that the expanded blossoms are about three inches across; the dense tuft of stamens is of a yellow colour, and the slightly protruded stigma deep green. Native of Real del Monte, in Mexico. Introduced before 1847. Flowers in ?——. *Culture*.—Requires a greenhouse; well drained sandy loam; kept moderately dry in winter; propagated by seeds or planting the offshoots.

CANTUA DEPENDENS, Persoon (drooping flowered *Cantua*).—Polemoniaceæ.—A very beautiful branching shrub, of about five or six feet high, downy in the younger parts. The

leaves are somewhat fascicled, and are of small size, varying much in figure, being sometimes oblong, sometimes obovate, and either acutish, or blunt with the base narrowed; they are also sometimes quite entire, and at other times have a few large deep teeth on the margin—the former is said to be more usually the case on the flowering branches, and the latter on the stronger barren ones. The flowers are drooping, and grow in terminal, few-flowered, rather loose corymbs; they reach as much as two inches and a half in length, with an ample tube, and measure nearly as much across the face of the spreading limb of five roundish lobes. The colour of the flowers is a fine light carmine, with a tint of rose. The leaves and wood when bruised afford a yellow colour, and might perhaps be usefully applied in dyeing. The flowers are used by the Peruvians for the decoration of their temples; by them the plant is called *Cocantu*. Native of the Peruvian Andes, near Huamantanga, and of Bolivia. Introduced in 1847. Flowers in spring and summer. It is the *Cantua tomentosa* (Cavanilles); *C. buxifolia* (Lamarck); and *Periphragmos dependens* (Ruiz and Pavon). *Culture*.—Requires a greenhouse; turfy peat and loam; propagated by cuttings, planted in sand, and placed in a gentle heat.

CANTUA PYRIFOLIA, Jussieu (pear-leaved *Cantua*).—Polemoniaceæ.—A rare and curious shrub, growing about five or six feet high, of somewhat erect habit, with fasciculate leaves, of an oblong or obovate form, either acute or obtuse, the base somewhat wedge-shaped, and the margin generally described as entire, but sometimes furnished with a few coarse teeth. The flowers form a dense terminal corymb, and are erect and curved, rather small, and of a pale straw colour. The leaves and wood of this species have the property of staining a yellow colour; the native name is *Turu*. Native of Peru, near Loxa, Chachapayos, and Huanuco. Introduced in 1846. Flowers in spring. It is the *Cantua peruviana* (Gmelin); *C. loxensis* (Willdenow); *C. flexuosa* (Persoon); and *Periphragmos flexuosus* (Ruiz and Pavon). *Culture*.—Requires a greenhouse; turfy loam and peat; propagated by cuttings.

BURLINGTONIA FRAGRANS, Lindley (sweet scented *Burlingtonia*).—Orchidaceæ § Vandææ-Ionopsidæ.—A very delicate and deliciously fragrant epiphytal species, with small pseudo-bulbs, each bearing one oblong lanceolate leaf, about nine inches long, and a pendent alternately flowered raceme, about eight inches long, with from nine to twelve flowers. The flowers are pure white, a little tinted outside, and almost pellucid, the lip differing in colour from the rest of the flower in being yellowish at the base, and there marked with three

delicate purplish lines, vertically drawn on the surface; at each side of the column, also, is a very short line of this colour, giving to this part a certain resemblance to the head of a caterpillar; the lower sepal is bent outwards near the base, and the lip is deeply cleft at the apex. Native of Brazil. Introduced in 1846, from the continental gardens, by Messrs. Rollißon of Tooting. Flowers in May. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the pseudo-bulbs.

GLOXINIA TEICHLERI of gardens (Teichler's *Gloxinia*).—Gesneraceæ § Gesnerææ.—A beautiful perennial plant, with a very short herbaceous stem, bearing opposite oblong velvety leaves, which are regularly serrated at the margins; the young leaves are pale pink beneath, except the veins, which are of pale green, as on the older ones. The flowers are axillary, monopetalous, about an inch and a half long, tubular, with a five-cleft limb; the interior of the tube, on the lower side, especially towards the limb, is rich crimson, the rest delicate pink; both the outer and inner surface being distinctly striped and mottled with light blue. This feature, together with the rich tinting on the lower part of the interior of the tube, will render this a striking and valuable variety. Raised by M. Joscht, gardener to the Count de Thun of Tetschen, Bavaria. Introduced from continental gardens in 1847, by Messrs. Rollißon of Tooting. Flowers in spring and summer. *Culture*.—Requires a stove; sandy loam and vegetable earth; propagated by cuttings of the leaves laid on damp sand under a glass, in a moderate heat.

LEPTOTES BICOLOR, var. *elegans* (elegant two-coloured *Leptotes*).—Orchidaceæ § Epidendrea-Læliadæ.—This variety differs from *L. bicolor* in the greater expansion and brighter colouring of the flowers. It has small pseudo-bulbs, from which proceed short, thick fleshy, quill-like leaves, having a groove or channel down the centre; the flowers grow on short footstalks, the petals and sepals pure white, about an inch and a half long; the lip is bright purple, with about a third of its length at the apex pure white: the flowers are strongly and pleasantly scented. Native of Brazil. Introduced in 1844 by Messrs. Rollißon. Flowers throughout the summer. *Culture*.—Requires a moist stove; turfy peat soil; propagated by division of the pseudo-bulbs.

ARPOPHYLLUM GIGANTEUM, *La Llave* (large Sickle-leaf).—Orchidaceæ § Epidendrea-Læliadæ.—This is a very distinct and handsome epiphyte; it has an erect four or five-jointed, smooth stem, from one to three feet high, slightly thickening upwards, and bearing at the top one stout, leathery, drooping, linear,

obtuse leaf, a foot and a half long, and an inch wide. The flowers grow in a compact, erect, cylindrical, spike-like raceme from the base of the leaf, the stalk issuing from a spathe; this raceme is often in the wild plant from a foot to eighteen inches long, thickly studded throughout with blossoms; but in the cultivated plants this size has not yet been attained. They are small, but arranged with the most beautiful regularity, and from their substance, and peculiar form, look like a symmetrical arrangement of little coloured shells. The colour of the sepals and petals is pale purple, the lip being of a deeper hue; and this part of the flower stands uppermost. Native of Mexico and Guatemala. Introduced in 1839, and again in 1846. Flowers in the spring and summer months. *Culture*.—Requires a moist stove; turfy peat soil; propagated by division of the plant.

NEW RADISH: ROSE OF WINTER.

THE esculent which bears this name was exhibited at the autumn show of the Horticultural Society of Liege in 1847, by Mr. Simonis Pire, seed merchant of that town. In general appearance it looks like a little turnip, and is of a conic form, with a smooth rose-coloured skin, on which there are here and there some horizontal yellowish marks or stripes, from which the fibres issue. The tail or tap-root is long. The leaves are rather large, broad, and smooth. In taste the present sort has all the qualities commonly sought in this favourite root. It is sharp, acrid, and fresh, or crimp, and on the whole grateful and easy of digestion; the flesh being firm and full, with a complete absence of fibre. Besides its size, form, and taste, one particular merit ascribed to it is, that it may be sown in September in order to be used in October or November; or sown in October, and so on, successively throughout the winter—whence its name. Seeds of it were imported to Belgium a few years ago, through the agency of French missionaries, among whom the name of M. S. Voisin is particularly connected with the history of this interesting crucifer.

The culture of this radish is very easy. In autumn and winter the seeds should be sown in a bed of rich light soil facing the south. They should be sown thinly, in order to give scope to the roots. In summer they may be sown in any situation where the soil is free and rich; and at all times the usual process of beating the ground with the spade should not be omitted. The radish does not like dryness; and, therefore, in continued warm weather, it ought to be freely watered night and morning.



CATTLEYA SPHENOPHORA.

Cattleya sphenophora, Morren (wedge-lipped *Cattleya*).—Orchidaceæ § Epidendrea-Læliadæ.

One group of the fine genus *Cattleya* is distinguished by having an olive-green colour prevailing in the flowers; yet although this is the case, the species of this character are far from unornamental, the greenish, and somewhat dull hue of one part of the blossoms, being mostly relieved by a mass of some pure brilliant colour in another part. *Cattleya guttata*, and *C. granulosa*, with some varieties, are examples of this group, familiar to the eyes of English orchid connoisseurs; and the species now under consideration will be a further addition to the same clique when it reaches our gardens, which it will probably do ere long, from those of Belgium.

Compared with *C. guttata*, the species with which Professor Morren regards this as being most intimately related, the chief differences are these:—the two lower sepals only, instead of the whole perianth, are of a stout fleshy texture; and these two parts, instead of being straight, are developed in a somewhat arched

position. The base of the lip, or labellum, is moreover in this plant marked merely by small furrows and a roughish surface, instead of being covered over with prominent tubercles, as in the other species; these being absolute differences of structure from the ground upon which the plant is regarded as specifically distinct.

It grows with a short upright stem, at the top of which are borne two stout oval, somewhat pointed leaves; from between these grows the short erect flower stem, supporting a raceme of about six blossoms, each measuring about two inches and a half in diameter: these consist of three lance-shaped sepals of a greenish-yellow ground colour, tinged with purplish-rose towards the point, and spotted over, especially near the end, with purple; the petals of similar form and colour; and the lip, which is white and purple, three-lobed, slightly furrowed, and at the base roughish, but not tuberculated; the side lobes are white, and are folded over the column, and the central lobe beyond that part is purple, bilobed, and nearly squared at the end.

The plant was found at St. Catherine's, in Brazil, from whence it was sent by Mr. F. Devos to M. Alexander Verschaffelt of Ghent—probably about 1845, but on this point the information is not explicit. From this source it will doubtless soon find its way to English gardens, if it be not already in them.

The Cattleyas are all South American plants, and require stove culture. The temperature which best suits them, ranges between sixty and seventy-five degrees, but should not exceed the latter; from sixty to sixty-five degrees is a good range for the winter season, and from sixty-five to seventy-five degrees is proper for the summer, or that part of it which may be the growing season. This degree of heat should be accompanied by abundant moisture, supplied by frequently sprinkling water over every absorbing surface in the house, such as the walls and pathway, by watering the heated pipes or flues once or twice a day, to raise a moderate quantity of steam, taking care not to wet them when hot enough to produce scalding steam, and by daily syringing tepid water lightly over the plants. In the winter, and when the plants are not growing, as well as during the flowering period, they must be kept much drier. They grow well, placed in pots, or baskets of moderate size, but do not like to be very frequently changed. In preparing the pots, after putting into them a quantity of crocks, a layer of sphagnum moss should be used, and the plants potted among rough turfy peat. The crown of the plant must be kept rather above the level of the pot-rim, so as to avoid the stagnation of water about this vital part. The young shoots, when they are pushing out from this part of the plant, are particularly liable to suffer injury from the accumulation of moisture about them. The potting is best performed about July or August, when the plants are beginning to form new roots from the base of the young shoots; when potted, the plant should be about two inches above the rim of the pot. Peat, naturally or artificially mixed with sphagnum, and again mixed with broken charcoal, is a proper medium for the roots. The plants should not be allowed to make more than two growths in a year; the production of a third growth, which sometimes happens under very exciting treatment, weakens the plants and spoils the blooming. When in flower, the plants should be removed to a cooler house, or to a drawing-room, where the blossoms remain much longer in beauty, than in the close humid atmosphere which produced them. The propagation of the plant is effected by dividing it, but the larger masses are most attractive and desirable.

GARDENING MEMORANDA FOR JUNE.*

THE tulip stage will, this month, be of great service to shelter from the sun some of those choice plants which will hardly stand the roughness of open weather, and yet require all the air they can have, especially hard-wooded green-house plants. The tulips are cleared away generally in a florist's garden, to make way for carnations and picotees; but it is not all florists who grow both; nevertheless, a canvass house is so essential to hard-wooded plants that they are quite worth the erection, if only for the purpose of summering them. The removing of all the flowering bulbs, as soon as their leaves decay, makes room for many other subjects, such as annuals raised for planting out, green-house plants, verbenas, and the like. The sun is now doing its work; watering must be done in earnest, where necessary: and here it is worth mentioning, that it is an operation much misunderstood; a good soaking that reaches down a few inches, once in a week, or even a longer period, is infinitely better than watering a little once a-day. Surface waterings encourage the growth of fibres at the top, and this dries very soon, so that the plant is constantly checked; but let the water soak down in quantity, as a long shower of rain would, and there is the growth of the root in its natural place, going deep after the nourishment it requires, and feeling no distress even if neglected occasionally. A garden engine is the best for watering, but it should be on a scale that enables us to pretty nearly float a place; or a hogshead on a barrow, with a rose tap to it, so that you have only to turn it on, and wheel 'it until it is empty. While you are using one, let labourers fill and bring you another, and change from time to time the empty one for a full one. This month weeds grow rapidly, and seed in a few days, if neglected; the old adage—"a stitch in time saves nine," should be continually borne in mind. Earwig hunting, moth, butterfly, and grub killing, and wasp destroying, may be the work of children, but it must not be undervalued, for much depends on it. The vines must be looked to now, and all the shoots not wanted must be rubbed off, nor must we be too covetous of fruit; a moderate quantity will grow and ripen, when a large one will not; generally speaking, a vine with a full crop should lose two bunches out of three, but much depends on the plan of pruning and training the vine. If the strawberries are wanted to be increased, the runners should be either pegged down to the beds, or into pots filled with soil, and only

* A very elaborate and complete Calendar of Gardening Operations for May is published in No. 29 of the Horticultural Magazine.

one joint should be allowed to remain on each runner; when, therefore, the first joint is pegged down, take off all beyond it. Fruit trees against the wall should have all the shoots that grow straight out removed. The syringe should be occasionally used, with a fine rose, but the water ejected with considerable force, to wash off any vermin that may be harbouring there; and when this has been used, the rake should be used along the foot of the wall, to bring away and destroy all the slugs, snails, &c. that may have been dislodged. Sowing, thinning, earthing up, and planting out, goes on in the kitchen garden. The greenhouse and conservatory want plenty of air. Climbing plants want training and constant attention to their growth, or they cannot be handsomely disposed. Examining the state of the roots of all growing plants, and a shift to large pots, where required, is one of the principal jobs in the houses. The removal of flowering plants from all the other depositories into the conservatory, will keep that in a blaze of bloom,—which should always be the case. It is the show-house, the other contrivances are all for merely getting the plants in a condition to be shown. Pinks are flowering this month, and it is no small undertaking to tie up the buds, and tear the calyx to prevent it from bursting, and to lay their petals properly as they are developed. Their increase, which is the grass that shoots out at bottom, requires piping. Carnations and picotees too require that the number of stems should never exceed one to a plant, nor the number of buds three to a stem, and these should be left according to our wants; either the crown bud, and the two that are nearest and easily managed, or, if the plants be too forward, the other buds, and the crown one thrown away with those to be removed. The crown bud, however, generally gives the best bloom, and, therefore, it is only to accommodate the season of showing that would tempt any body to remove that.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING JUNE.

The Greenhouse.—From sixty to sixty-five degrees by day, and fifty degrees during the night.

The Conservatory.—From seventy to seventy-five degrees during the day, and about fifty-five degrees at night.

The Plant-Stove.—From eighty to eighty-five degrees during the day, and sixty-five degrees during the night.

The Orchid-House.—The warm house from eighty-five to ninety degrees by day, and about seventy at night. The cool house, seventy-five degrees by day, and sixty-five degrees at night.

THE BALSAM.

VERY few persons cultivate this plant with good taste, and too many go to work as if the only object were size. Hence we find, that in exhibitions where these plants figure they are very large, the flowers distant, great part of the stem naked, and the only recommendation belonging to them is the great size of their individual flowers, and the monstrous appearance of the plants themselves. The various colours and shades, the odd way in which many are striped or blotched, and the supposed difficulty of producing them in good order, deters many from pretending to grow them in pots; while the judges at Horticultural exhibitions awarding prizes to the largest instead of the best is a great discouragement to all but those who persevere in producing monsters, because they are the most likely to win. It has been said, that they will rise four feet, and be fifteen feet round or five feet across. This may be; but the proper way to grow a plant is to have nothing coarse about it, and to keep it in strong condition with good proportion of leaf, stem, and flowers, and let it grow its own way. The properties for a good balsam are,—

First, branches down to the surface of the pot, no bare stem, flowers close together, and foliage among and beyond them. The flowers completely circling the stem on all sides.

Second, the individual flowers large, round, and double.

Third, the petals thick and smooth on the edges.

Fourth, the colours dense, and if blotched or striped, the marks well defined, not running into each other.

Fifth, the plant the same width across as it is high.

These conditions can only be attained by careful and even growing, without great heat, and by carefully avoiding all sudden changes.

SEED, AND SOWING, SOIL, ETC.

It has been said, and we have never been able to contradict it from experience, that the older the seed is, the better, and more sure to come double; we have seen it recommended at not less than nine years old. It is said, that cucumber and melon seed cannot be too old, but these are often used the next season; and if put into the warm pocket after drying it will be good in a year. We have acted upon this with the balsam, and found it equally beneficial. The only good that keeping can do is, to dry by degrees; and it will be found that wearing in the warm pocket quite loose will hasten the ripening or rather the drying of the balsam. Sow the seeds in the beginning of March, and again in the beginning of

April, in wide-mouthed pots, and in a slight hot-bed, that is to say, the heat not allowed above 60°. When it does exceed this open it at the back to let some of the heat out, so that it may not get above 60°. In a very short time these seeds will be up, and then air must be freely given, though the heat may not be too great, but it ought not to be allowed to decline below 45°. If they become drawn in the seedling state it is very difficult to get them right again. As soon as they get a second pair of leaves they should be carefully transplanted. And here we may say something about the soil to be used from the first to the last. As the best that can be had, we should recommend rotted turves, which have been cut from a loamy rich pasture, and with all the grass fibres and roots decayed in it: this need only be rubbed through a potato sieve; not that we require the earth small, but that it enables us to see any of the troublesome grubs, wire-worms, &c., with which the turf may be infested, and which ought to be caught and killed by hand; for all washes, salts, lime, &c. that might annoy them would alter the character of the soil. By rubbing it through a very coarse sieve, such as the smallest potatoes are sifted through, any large lumps of turf not completely rotted, and also great stones, will be easily taken out and thrown away. If this cannot be got, and clean loam is obliged to be used, half of this added to one-fourth turfy peat and leaf-mould mixed, and one-fourth decomposed cowdung, will be the next best soil to use; this should by rights lay together some time, and be well mixed together before using; still, rotted leaves are to be preferred, and no florist should be without a compost, which is more valuable than any other.

POTTING.

When the seedlings get their second pair of leaves, take pots of the size called forty-eights, that is to say, forty-eight pots to the cast; and having put crocks one-third of the way up, fill the pots with the compost; raise the seedlings in the pots with a piece of flat wood like the blade of a knife, with as much of the earth as hangs on the roots, and, making allowance for the room it will take, make a hole in the centre of the soil in the pot, thrusting the wood down a little way, and press the soil sideways to open a vacancy; plant the seedling in without disturbing the fibres, and put soil upon it, pressing the soil enough to close the earth about the roots; or fill the pots all but an inch of the top, place the seedling in the centre on the soil, holding it with one hand, while with the other the rest of the soil is put in to fill up the pot, gently pressing it around the sides to prevent the plant from sinking too low, and

only covering the roots to the collar; water at the same instant, so that the plant shall not flag a moment. These pots are all to be replaced in the hot-bed, and covered a few hours with a mat, with the frame closed. They must then have a little air daily, and the frame must be sunk or the soil in it raised, so that the plants be near the glass, and all of them near alike; that is to say, not more than three inches from it. They will grow rapidly, want water frequently, and air must be given at the back of the frame, by propping up the light half an inch or an inch according to the heat of the bed.

SHIFTING INTO LARGER POTS.

As soon as the roots reach the sides of the pots, which will be seen by turning out one of the balls occasionally, prepare pots a size larger, viz. thirty-twos, and a few crocks at the bottom of each. As soon as the roots begin to mat, or grow freely on the outside of the ball, and close to the pot, they will be ready for the change: put as much soil on the crocks as will raise the ball to the surface of the pot, then turn them out, one by one, and placing them in the centre of the larger pot, fill in the soil all around it, carefully pressing it down the side without damaging the fibres, and levelling the top of the soil nearly up to the edge of the pot; for watering will sink it a little. These must all be returned to the hot-bed, which will be cooler for the work it has done; and the weather being warmer, it need only be carefully closed in bad weather and of a night, and be well protected with a covering of some kind. Now the frame may require raising, to prevent the plants from touching the glass; and it is very easy to do this, not only until the bottom edge of it is as high as the soil, but long afterwards; because, by using turves outside it and propping the frame up at the corners, almost any height may be obtained to give the plants room; but it will be well to prepare another bed or a pit, as the plants advance much in height. As the weather becomes warmer, they will only require the natural heat of a green-house or pit; and in the warm part of the day should have all the air that can be given. When the roots get to the side of the thirty-twos, the plants must be shifted, in a similar manner, to twenty-fours.

THE BLOOMING.

This is made a very particular job by some people. They will pick off all the first buds; but if the balsam be allowed to grow naturally in the soil we have mentioned, and we keep them near the glass, and shifted from time to time from one pot to another, the plants will be better allowed to bloom as they are in-

clined. They will be short, stout, well proportioned, good-looking plants, from the moment they open a flower until they are in full bloom. All that need be done is, to take off the decayed and decaying flowers (unless the seed is wanted), and they will keep in perfection a long time. Some of the plants will not flower until they are in the largest sized pots; but we prefer keeping them in size twenty-four for the largest, and there letting them bloom. They may be wonderful and extraordinary when they attain a large size; but they will never please the man of true taste. The colours are not so brilliant, the flowers are more loose, and the plant becomes less bushy and attractive. But let it not be imagined, that there is any difficulty in growing them large. The only trouble is, that imposed on us by the handling of larger and heavier subjects.

SAVING THE SEED.

The instant you find a balsam opening its flowers, consider whether it is such as you would like seed from, and remove it far from all the rest; when you come to another that is equally desirable, but of a different colour, take that to the first. Let them all be removed to some part of the garden where there is no other of the tribe, and turn them out into the open ground, that they may have all the air, rain, and wind; beyond choosing a sheltered spot, they will require no protection; but as the seed-pods swell they will require constant watching, so that as soon as the pods are full-grown they may be gathered and put into a deep vessel of some kind; because when they spring open they send the seed an immense distance, and much of it would be lost if the box or other vessel they were put in were shallow; and so also would it be scattered in all directions if allowed to split or spring open on the plant. The plants for seed will require to be frequently watered, and it would be wrong to put any out for seed except such as have the good qualities we have pointed out, or at least some one or more of them, in a large degree. It is but chance-work what we obtain from seed, and there is no way of perpetuating the plant; but the character of seed saved carefully, even of the most sporting annuals, may be greatly improved by proper selection.

GENERAL REMARKS.

All the difference between growing larger plants is, that the larger ones are kept growing fast, with plenty of pot-room, and keeping up the heat, picking off the premature bloom-buds to prevent any check of their growth, and giving a few more shifts from one pot to another.

CANTUA DEPENDENS.

Cantua dependens, Persoon (drooping-flowered Cantua).—Polemoniaceae.

Peru seems now to be contributing liberally to the adornment of our gardens. Many of the novelties which have of late been added to English collections have come from thence; and a large proportion of them must be ranked, not as mere novelties, but as objects strongly impressed with the characteristic of beauty. Amongst the latter must be placed the plant now under notice.

The *Cantua dependens* is, by the Peruvian Indians, called *Cocantu*, or the Magic Tree, whence, probably, the generic name it bears amongst men of science was derived. Its flowers are said to be, by the native Indians,



much prized for the purpose of adorning their temples and consecrated localities. The plant possesses also a staining property, the leaves and wood, when bruised, affording a yellow colour, but probably, in a commercial point of view, this feature is not of much importance; other agents equally suited for the purpose being more accessible.

Those who have had an opportunity of seeing it in its wild condition about the villages of the Peruvians, state that it forms a small branching shrub, of about five or six feet in height, and becoming exceedingly ornamental when in a blooming state, each of its numerous branches terminating in a drooping cluster of flowers. The foliage, judging from the appearance of small plants, varies considerably

in form, and this also is described as having been noticed in the more mature wild specimens. The surface of the plant, moreover, is liable to variation, being sometimes quite smooth, and at other times more or less hairy. The leaves vary in outline from oblong to obovate, being sometimes rather acute, at other times blunt-ended, and sometimes so much narrowed to the base, as to assume a wedge-like form; the margin is sometimes entire, and sometimes cut into a few large coarse teeth; the latter apparently more commonly occurring in the grosser luxuriant shoots, which do not bear blossoms. The flowers themselves grow a few together in rather loose corymba, at the ends of all or most of the branches, and assume a gracefully dependent position; they are of course monopetalous, consisting of a proportionately wide and ample tube, of about a couple of inches or more in length, and divided at the end into five roundish lobes, which spread out so as to form a flat horizontal face, of about an inch and a half in diameter; the tubular part of the flower, as well as the throat, is yellow, and the spreading limb is of a pale carmine hue, very faintly suffused with a rosy tint; the stamens project beyond the corolla, the tubular part of which is, moreover, half concealed by the green calyx. It should be stated, that when the plant assumes its proper character, the leaves grow somewhat clustered. The range of its blooming season is not definitively ascertained. Young plants raised from the original imported stock flowered early in May; and it seems probable, from the habit of the plant, that it may naturally go on producing its flowers throughout the summer season; this, however, remains to be seen.

As before remarked, this species is of Peruvian origin. It is also found in Bolivia, whence it appears that Messrs. Veitch, of Exeter, received it in 1847. The Peruvian Andes seem to afford it a home, and the neighbourhood of Huamantanga is one of the localities where it has been particularly observed.

Several names appear to have been given to this plant at different times, by various botanists. Ruiz and Pavon, who have published a very good representation of it in the *Flora Peruviana*, which has afforded the chief materials for our engraving, called it *Periphragmos dependens*. Persoon called it *Cantua dependens*; and Cavanilles, *Cantua tomentosa*. Lamarck, again, gave it the name of *Cantua buxifolia*, which Mr. Bentham has preferred in De Candolle's *Prodromus*. It is, besides, the *Cantua bicolor* of gardens.

It is a greenhouse shrub, of easy cultivation, growing freely in a soil of light loamy texture, and admitting of being freely propagated by means of cuttings planted in sandy soil, and placed in a mild hot-bed. The soil

in which the maturer plants are placed should not be too much enriched by manure, for this would foster a luxuriant habit, inimical to the production of flowers. The other extreme, however, must be as carefully avoided.

GREENHOUSE ORCHIDS.

NOTWITHSTANDING that the idea of a very "hot" house is—and perhaps not unreasonably—associated with these singular plants, the flowers of which are fancifully compared to the insect world, there are very many of them which grow in a temperature such as would be afforded by a structure intermediate in this respect between an ordinary stove and greenhouse. We propose chiefly in this place to point out a selection of handsome kinds from among those which may be grown under the cool treatment here referred to. The great bulk of species found in central America are of this class. It should, however, not be concealed, that although a selection of very beautiful kinds may be grown under the conditions we are speaking of, there are many others, including some of the more remarkable of the whole race, which can only be grown in a climate resembling that of the tropics. The culture of Orchids in a greenhouse, on the cool system, does not differ in principle, but in degree, from that practised in the warmer temperature with which in idea they are more usually associated. The difference consists in rendering the period of rest or repose somewhat more rigid and decisive, and making it correspond strictly with our winter; and in taking advantage of the summer period of the year chiefly to induce the growth and blooming of the plants.

One thing should not be lost sight of by those who attempt to grow these plants on the cool system only, and that is, that by this means they cannot have that continual succession of bloom, which is kept up by the flowering of one or other of the species under the other course of treatment. Little or no blossom can be expected in the winter season; and as during summer the growth of most of the kinds will be going on simultaneously, it is probable that many would be thrown into bloom at nearly the same period, though the different habits assumed by the various species would cause some difference in this respect.

We shall now proceed to sketch out briefly the course of treatment which it would be most desirable to follow; and in doing so, will arrange our observations under the heads of Winter treatment, and Summer treatment, including the operations of potting and watering.

Winter treatment.—During the winter

season the plants must be at rest. We must suppose them to be placed in a well constructed greenhouse, provided with the full heating powers such a structure usually commands, and water tight and wind tight, so far as perfect repair and sound glass can make it. The house may be large or small, and may either be a lean-to, that is, a sloping glass roof against a perpendicular opaque wall, or span-roofed, that is, two slopes of glass placed side by side, and sloping in opposite directions. Aspect is not very material, but perhaps near the south would in this case be desirable, for the sake of the extra warmth which would be derived from the sun if thus placed. It would also be desirable to have the house wholly occupied by these, or at least by such other plants with them, as would submit to the treatment they required. In such a house the plants should be placed. They should be nearly or quite dry, water being withheld from them in autumn, and only so much applied—at wide intervals—as would prevent them from losing their vitality from drought; they will bear to shrivel a little without injury. Whatever medium may be about their roots, whether turfy peat or sphagnum, or moss of any other kind, should appear comparatively dry when placed beside the ordinary slightly moistened soil which is kept about the roots of common greenhouse plants at this season of the year—it should not be quite so dry as dust, but considerably drier than would be sufficient to render it friable, and easily handled without adhesion. The nearer the roots and the soil can be kept in this condition throughout their period of rest—the winter, the safer they will be; and this may be accomplished by looking over, say once a-week, and with a spouted watering pot pouring a little tepid water on the soil—not on the plant—where it was observed to be getting drier than it should be. But little air need be given; on fine days a little fresh air may be admitted to assist in purifying the atmosphere, but in cold bleak weather this will be unnecessary; the middle of warm sunny days is at all times the most suitable period for admitting it. The temperature may be kept at about an average of from forty-five to fifty degrees during the day, which should be maintained by slight fires in the morning, in conjunction with such sun heat as may be available. The lowest temperature should be during the most inclement weather, for it is very erroneous management during such periods to keep the temperature up by extra fire heat, as is even in these days too often done. At night, it would be desirable to keep the temperature ranging about forty degrees, though in case of emergency, if the plants are dry, three or four degrees lower would not do much harm.

They should not be allowed to get frozen if it can be avoided. The safety of the plants while submitted to so low a temperature, is almost entirely dependent on their being kept dry, as already pointed out. If it should chance that any of the plants begin to grow, do not then check them more than is unavoidable, but give them the warmest places the house affords, and a slightly increased quantity of water.

Summer treatment.—The winter treatment ought to be continued till the end of March, unless a little fire heat can be afforded. If so, it may cease about the beginning of March. At whichever season it may be, the first change is to slightly elevate the temperature, say from an average of fifty degrees to a minimum of fifty degrees. A trifling amount more of water may be given too—about enough to keep the soil just evenly moistened, as is attempted *during winter* with other delicate plants: always use warm water, that is to say, water heated equal to, or ten degrees above, the temperature of the atmosphere kept up; this guards the plants from many checks just as they are about to start afresh. Do not be anxious to give air at first: it is of little importance whether any is given, and if some is given, the least possible amount will suffice. If a little fire heat can be given during March, April, and May, the plants may be got on well, for this will suffice to start and keep up their young growth, and the summer atmosphere would then carry them on. The cost of this would not be a heavy amount, as in neither month would a strong fire be requisite. In March it would be desirable to start with a minimum of fifty degrees; in April there should be a minimum of fifty-five degrees; and in May of sixty degrees. These increases would be almost covered by the increasing natural warmth of the season, as all the sun heat that could be caught should be husbanded, by avoiding careless ventilation. A few hours sun even in March would raise the temperature perhaps to sixty degrees; and if the house were kept close, as it should be, this would go far towards supplying the fifty degrees minimum required during the night; at least, a very slight fire late in the evening would be quite enough. If more than sixty degrees sun heat occurred in March, a little air might be given, to prevent what would under the circumstances be an excess of heat. In April a maximum of sixty-five degrees, and in May of seventy degrees or rather more, would be sufficient, and this would serve as a guide when, and when not, to admit much air, for it should be recollected that the chilling of the plants by over ventilation would be to them a greater evil than they would sustain by being kept as close as an ordinary green-

house would keep them. One thing should be kept in mind, and that is, the day temperature ought to be kept well up to the point; a day or two at a time somewhat lower does no great injury, but generally the heat by day should be maintained, for it is this that must be looked to, to set the plants growing, and to keep them so. There should, therefore, be a slight fire in the mornings, even on fine days, for an hour or two, to get a fair start; and in the case of cold dull days, the fire should be looked to, to keep up about the minimum heat specified. Another point—though fifty degrees is named as a minimum for March, fifty-five for April, and so on, the changes are not to be made as sudden as the transition from one month to the next, but the temperature should be from the first gradually ascending, but in such a way that these figures may about represent the comparative rise. Then as to water, more and more must be given from time to time; and about a fortnight after the summer treatment begins, the syringe may be slightly used—a little gently over the plants, and more fully on the paths, and walls, and stages, so as to raise a moist atmosphere. At first, this should be done once a-day, say about nine A.M. when there is a nice warmth in the house; and warmed water, as before mentioned, must *always* be used. Subsequently—the change being brought about gradually—the plants may be well syringed twice a-day, (excepting those in bloom, which the syringing is apt to injure,) and the paths and walls, &c. perhaps twice besides. By the beginning of May, if the season is a bright one, some shading is required; this is most simply afforded, by then fixing permanently over the sunny side of the roof a covering of thin canvass, either single or folded, according to its capacity for excluding light; the sun's rays should be pretty well broken. Before the permanent shade is requisite, it may be necessary in the middle of hot days to throw a mat over the glass. The shade is to be removed in September, when the power of the sun becomes weakened. The re-potting of the plants—or at least re-arranging, for some grow in open baskets and others on blocks—is best done as the plants indicate signs of pushing out new growth, which would in most cases be in a little time after the heat was increased. In doing this, the old live roots—and the more of these the plants have, the better—must be carefully preserved from injury; and the soil or moss employed should always have been previously warmed, so as not to chill them. The epiphytal kinds grown in pots should be well elevated *upon* rough lumps of turfy peat soil, made firm by little pegs, and by careful arrangement; and the soil should be intermixed with lumps of charcoal and broken

crocks. Those planted in open-work baskets, of whatever kind, require very turfy peat, or very frequently moss is used, or sometimes peat and moss together. Those placed on blocks of wood have a little moss fastened round their roots, and they are fixed by means of copper wire and copper tacks (iron would rust). If some of the handsomer looking growing mosses were employed instead of dead sphagnum moss, it would be an improvement. The terrestrial kinds require re-potting in the ordinary way, in turfy peat soil, well drained. Newly potted plants require very careful watering. When any of the plants come into bloom, they must be kept rather drier than before, to preserve their blossoms; and such plants should more particularly be well shaded from powerful sun. After May, the house would be kept warm enough by shutting in the sun heat; that is, not giving too much air to allow the heat thus derived to be as rapidly dissipated. A very good maximum throughout the summer would be seventy-five degrees, and sixty degrees as a minimum would be near what would suit the plants. Of course the temperature would vary according as the days were sunny or cloudy, but this would not injure the plants. During much of the summer, too, the air is mild and balmy, and then ventilation may be freely permitted even for a considerable part of the day, and sometimes, when very warm, slightly all night; at other times, when the air is cold, it is not at all material to give much air, or even if none is admitted formally, for some few days together, it will cause but little difference to the plants. In the latter end of the summer, however, it is desirable to give air more freely. Throughout this—summer—season of the year, the watering and syringing must be kept up regularly, and with no niggard hand. By the end of September, a change must be commenced. There will naturally be less heat, and there should be less water artificially applied; this must be broken off gradually in the same way it was commenced in spring, so that by the beginning of November the plants and soil may be in that comparatively dry state we have already endeavoured to describe. Throughout this early part of the autumn, air should be very freely admitted throughout the day, to keep the temperature cool, and to help in passing off extraneous moisture and drying the interior of the house.

The following are a hundred good—perhaps not the best—species, adapted for this mode of treatment. Those who set about cultivating them, should at the same time try a few experiments with some of the supposed tenderer kinds; the terrestrial species in the list are all marked as such; the others, where

directed to be potted, must be more or less elevated above the rim:—

Acineta Barkeri (Mr. Barker's), has very long dropping racemes of large full yellow flowers, and is altogether a magnificent species; native of Xalapa in Mexico. Synonyme—*Peristeria Barkeri*. The *Acinetas* should be grown in open baskets, and suspended in the warmest part of the house.

Acineta Humboldtii (Humboldt's), has large rich chocolate-spotted flowers, in long drooping racemes; it is a native of La Guayra. Synonymes—*Peristeria Humboldtii*, *Anguloa superba*.

Acropera Loddigesii (Loddiges'), has pale yellow flowers, spotted with purple, borne in pendent racemes, and having a rich aromatic scent, native of Mexico. It may be grown either in pots or baskets. Synonyme—*Maxillaria galeata*.

Aspasia epidendroides (epidendrum-like), has flowers gaily mottled with white, yellow, and purple, borne in upright spikes; native of Costa Rica and Guatemala. It will do well either on a block or in a pot.

Barkeria Lindleyana (Lindley's), bears upright racemes of beautiful deep rosy purple flowers, nearly white in the centre, the lip tipped with deeper rose colour; native of Guatemala. The *Barkerias* do best in baskets filled with moss.

Barkeria spectabilis (showy), has lovely lilac flowers, white in the middle, richly marked with blood-red spots; native of Guatemala.

Bletia hyacinthina (hyacinth-like), has upright spikes of rich rosy purple flowers, tinged with blue, and blotched with dark crimson; native of China. The *Bletias* are terrestrial species, growing in pots, in not on the soil; they mostly die down in winter.

Bletia Shepherdii (Shepherd's), has upright spikes of dark rich purple flowers, the lip marked in the centre with longitudinal yellow plaits; native of Jamaica.

Bolbophyllum umbellatum (umbel-flowered), has a slender stem, from six to eight inches high from the base of the pseudo-bulbs, bearing at the top an umbel of pretty, though small, cream-coloured flowers, spotted with purple; native of the hills of Northern India. It should be grown in pots.

Brasavola glauca (glaucous), has handsome pale green flowers, with a white labellum, which emits a very agreeable aromatic perfume; native of Xalapa. It should be grown on a block of wood, or potted.

Brassia brachiata (brachiated), has long racemes of yellowish-green flowers, spotted and blotched with brown; native of Guatemala. Synonyme—*Brassia Wrayæ*. The *Brassias* may be grown in pots.

Brassia verrucosa (warted), has spreading racemes of greenish-white flowers, dotted with green warts; native of Guatemala.

Broughtonia sanguinea (blood-coloured), is a small-growing plant, producing erect racemes of rich crimson blossoms; native of Jamaica. It should be placed on a block of wood, and put in the warmest part of the house.

Calanthe discolor (discoloured), is a dwarf plant, with erect flower stems; the flowers have brown sepals and petals, and a pinkish-white lip; native of Japan. It is a terrestrial species, and should be grown in a pot.

Catasetum laminatum (plaited), produces erect racemes of large pouch-like blossoms spotted with purple; the lip is sometimes white, and sometimes spotted with purple; native of Mexico. The *Catasetums* should be grown in pots, and kept in the warmest part of the house; they like sun.

Cattleya granulosa (granulated, or rough-lipped), bears large blossoms, of which the sepals and petals are olive-green mottled with brown, and the labellum white, beautifully spotted with crimson and orange; native of Guatemala. The *Cattleyas* may be grown well in pots; they require to be kept rather dry, especially in winter.

Cattleya intermedia (intermediate), bears a short upright stem, which has near the top two or three delicate rose-coloured flowers; native of Rio Janeiro.

Cattleya labiata (lipped), has the sepals and petals of a delicate rose-colour, the labellum striped, and blotched with deep crimson; the edges tinged with purple, and beautifully fringed; native of Brazil. This may be grown on the cool system, but the flowers come smaller. *C. Mossiæ* (Moss's), is a very beautiful kind, near to this.

Cattleya Skinneri (Skinner's), has large flowers, of a beautiful rich deep rose colour; the lip rosy purple, with a white throat; native of the warm coasts of Guatemala. Should be grown in a very light compost.

Chloræa virescens (green-veined), has a close erect spike of large orange-yellow blossoms, marked with green veins; native of the sub-Alpine pastures of the Cordilleras of Chili. It is one of the terrestrial species, and should be potted in rough sandy peat. Synonyme—*C. chrysanthæ*.

Cælogyne cristata (crested), has very beautiful white blossoms, marked in the centre of the lip with bright yellow fringes and plaits; native of Nepal. The *Cælogynes* should be grown on a block of wood, or elevated in pots.

Cælogyne Gardneriana (Dr. Gardner's), also produces large white blossoms, tinged and marked with yellow; it grows on trees and

rocks in shady woods; native of the Khoosea Hills.

Cynoches ventricosum (bellied), has pendulous racemes of curious shaped blossoms, which have a fancied resemblance to a swan; they are of a yellowish-green colour, and the sepals and petals are thrown back, so that they touch one another; native of Guatemala. It should be well elevated in the pot.

Cymbidium sinense (Chinese), has brownish coloured flowers, with a yellowish-green lip spotted with purple, in upright spikes; the flowers are very fragrant; native of China. It is terrestrial, and should be grown in pots. Synonyme—*C. fragrans*.

Cypripedium insigne (noble), has yellowish-green flowers, spotted and streaked with brown; the labellum orange; native of Nepal. The *Cypripediums* are terrestrial, and should be grown in pots of turfy peat.

Cypripedium Irapeanum (Irapean), has an upright stem bearing two—sometimes four—large yellow flowers, the sepals and petals of which are oblong, and the lip forming a large deeper-coloured pouch; native of Mexico, near the town of Irapeo. This species dies down in winter.

Cypripedium venustum (beautiful), has singularly mottled leaves, and yellowish green flowers tinged with bright red, and spotted and veined with rich brown; native of Nepal.

Cyrtochilum filipes (slender), produces a very long slender flower stem, bearing a few flowers of a yellowish colour, the sepals and petals blotched with brown; native of Guatemala. The *Cyrtochilums* may be grown on blocks or in pots.

Cyrtochilum maculatum (spotted), produces a branching scape of showy blossoms, of which the sepals and petals are greenish, marked with large deep brown coloured blotches, and the lip is white—in some cases tipped with yellow; native of Guatemala.

Cyrtochilum maculatum, var. *Russellianum* (Lord E. Russell's variety), has very richly spotted flowers of greenish ground colour marked with dark brown, with a whitish labellum; native of Guatemala.

Dendrobium alpestre (alpine), is a diminutive plant, producing its flowers in a small spike at the top of the stem; they are white, with the labellum finely marked with purple; native of the Himalayan Mountains. The smaller *Dendrobiums* should be grown on blocks of wood; the larger ones either in baskets or in pots.

Dendrobium æmulum (rival), is a very pretty small species, bearing drooping racemes of white blossoms striped with purple, and very abundantly produced; native of New South Wales. It should be grown on a block and suspended.

Dendrobium Devonianum (Duke of Devon-

shire's), is a very beautiful species not of large growth; it has cream-coloured sepals with a dash of pink, pink petals with a deep purple stain at the points, and a broad exquisitely fringed lip, deep purple at the extremity, with two rich orange blotches, one on each side; native of the Khoosea Hills, in very dense woods.

Dendrobium elongatum (elongated), produces its blossoms on a slender erect stem; they are yellow, the sepals and petals being paler than the lip; native of New South Wales. It should be grown on a log of wood.

Dendrobium Kingianum (King's), is a dwarf plant, with handsome deep pink or rose coloured flowers; native of New Holland.

Dendrobium moniliforme (necklace-stemmed), has drooping racemes of lovely rose coloured flowers nearly white towards the centre, with the lip tipped with deep rose purple; native of China and Japan.

Dendrobium speciosum (showy), has long spikes of fine pale yellow flowers; native of New Holland.

Epidendrum aloifolium (aloe-leaved), has handsome flowers, with bright green sepals and petals, and a white labellum; and long drooping aloe-like leaves; native of Mexico. It does best on a block, and suspended. Most of the *Epidendrums* do well in pots.

Epidendrum aromaticum (aromatic), has a much branched flower stem, and bears a profusion of beautiful yellowish white flowers, which are strongly and agreeably scented; native of Guatemala.

Epidendrum aurantiacum (orange coloured), has rich orange coloured flowers, streaked with crimson; native of Guatemala.

Epidendrum cuspidatum (pointed), has fragrant yellowish green flowers with a white fringed labellum; native of Mexico.

Epidendrum macrochilum (large lipped), has an erect scape of very handsome flowers, of which the sepals and petals are greenish brown, and the lip creamy white with a purple spot at the base; native of Mexico. A variety called *roseum* has a rose coloured labellum, and is very handsome.

Epidendrum radicans (rooting stemmed), produces long upright stems, furnished with short blunt leaves, opposite to each of which a rootlet is protruded; the flowers grow in large terminal heads, and are of a rich orange red colour, the lip yellower; native of Guatemala.

Epidendrum raniferum (frog), has nodding racemes of blossoms which are greenish yellow, marked with rich purple brown spots; native of Mexico.

Epidendrum Skinneri (Skinner's), has very pretty rosy pink flowers with a stripe of orange-yellow in the labellum; native of

Guatemala. This grows well in an open basket.

Epidendrum Stamfordianum (Mr. Stamford's), produces a half-pendent branched raceme of smallish flowers, of which the sepals and petals are green stained with red, and the lip pale green with a dark red mark in the centre; native of Guatemala. It is deliciously scented.

Epidendrum verrucosum (warty), has rich crimson-pink very fragrant flowers; native of Mexico.

Epidendrum vitellinum (yolk-of-egg coloured), has very fine flowers, the sepals and petals rich orange, and the labellum bright yellow; native of Mexico.

Gongora truncata (bean budded), has drooping racemes of pale straw coloured blossoms, spotted and speckled with brownish purple, and the lip clear light yellow; native of Mexico. Gongoras should be grown in baskets, and suspended.

Hæmaria discolor (discoloured), has velvety deep reddish green leaves, and erect spikes of white oddly shaped blossoms, which are freely produced; native of Brazil. Synonyme—*Goodyera discolor*. A terrestrial species, and should be grown in turfy peat.

Lælia acuminata (tapering), has an erectish flower scape, bearing whitish flowers stained with purple, and curiously marked with purple on the throat of the labellum; native of Oaxaca. The *Lælias* generally do best on blocks of wood, or in open baskets.

Lælia albida (whitish), has erect spikes of white flowers, the labellum tinged with yellow in the centre, surrounded by a stain of reddish purple; they smell like primroses; native of Mexico. This grows best in a pot.

Lælia anceps (two-edged), has rich rosy lilac coloured flowers, with the labellum of a rich velvet-like purple, marked with crimson and yellow veins; native of Oaxaca.

Lælia autumnalis (autumnal), is a beautiful plant; the sepals and petals are pale blush shaded with a deeper tint, the labellum nearly white terminating with rosy lilac; native of Mexico.

Lælia flava (yellow), is a small growing plant, which produces tolerably handsome rich yellow blossoms inclining to orange; native of Mexico. It should be grown on a block or in a pot.

Lælia majalis (May-flower), has rosy lilac flowers, the two side lobes of the three-lobed labellum tinged with lilac on a pale ground colour, the other stained and blotched with rosy purple; native of Oaxaca, in elevated districts, where the temperature sometimes falls below freezing point; it requires pot cultivation.

Lælia peduncularis (pedunculated), has

delicate rose coloured flowers with a purple blotch at the base of the lip; native of Guatemala and Mexico.

Lælia superbiens (stately), is a very beautiful plant, with flowers of rosy pink, striped with a darker colour; the labellum is rich crimson and yellow striped with dark crimson; native of Guatemala. This should be grown in a large basket.

Lycaste aromatica (aromatic), has very fragrant rich yellow flowers; native of Mexico: grows well in pots. The *Lycastes* should be grown in pots. They were formerly called *Maxillarias*.

Lycaste cruenta (blood stained), has large orange yellow blossoms growing numerously from the base of its pseudo-bulbs, each on a separate stalk; they have the lip richly stained with crimson; native of Guatemala.

Lycaste Deppei (Mr. Deppe's), produces its numerous large flowers on separate stalks from the base of the pseudo-bulbs; the sepals are green spotted with brown, the petals are white spotted with brown, and the lip is white and orange coloured; native of Mexico.

Lycaste macrobulbon (large bulbed), has large orange coloured blossoms in the way of *L. aromatica*, but scentless; they grow up from the base of the pseudo bulbs; native of Sierra Nevada in Santa Martha.

Lycaste Skinneri (Skinner's), has large flowers, the sepals pure white faintly tinged at the base with crimson, the petals of a more rosy hue, the labellum almost covered with spots and streaks of a beautiful carmine; native of Guatemala.

Maxillaria tenuifolia (slender leaved), is a pretty species with graceful narrow leaves, and flowers springing up from the base of the plant; they are of a rich purple spotted and broken with small yellow patches; native of Vera Cruz. It grows well in a pot of turfy peat.

Mormodes Cartoni (Mr. Carton's), produces upright racemes of blossoms from the sides of the erect stems; they are yellow striped with crimson, and very gay; native of the temperate regions of Santa Martha. The *Mormodes* may be potted in turfy peat, and somewhat elevated.

Mormodes pardina (leopard-spotted), has upright spikes of curiously marked flowers, which are of a yellowish ground colour spotted and blotched all over with crimson; native of Mexico.

Odontoglossum Cervantesii (Cervantes'), has pretty delicate pink flowers, the base of the petals and sepals being marked with concentric bands of crimson; native of Oaxaca. The *Odontoglossums* may be grown either in pots or in baskets, or on blocks; the smaller ones are perhaps best on blocks.

Odontoglossum cordatum (heart-shaped

lipped), produces a short spreading raceme of handsome blossoms, the sepals being greenish barred with brown, and the petals and lip pale greenish yellow concentrically marked with purple; native of Mexico.

Odontoglossum grande (magnificent), has very large flowers, the sepals mottled and barred with rich brown on a yellow ground, the petals rich brown and yellow, and the labellum blotched with pinkish brown on a whitish ground; the flowers last long; native of Guatemala.

Odontoglossum hastilabium (halberd lipped), has a long raceme of gay and fragrant blossoms, the sepals and petals greenish barred with purple, the lip purple at the base, with a large white halberd-shaped extremity; native of Pamplona in New Granada, at a considerable elevation.

Odontoglossum membranaceum (membranaceous), has flowers a good deal like *O. Cervantesii*, but the concentric crimson bands cross the base of the labellum; native of Oaxaca.

Odontoglossum pulchellum (pretty), is a very pretty species having white blossoms, the crest of the lip only being spotted with crimson; native of Guatemala. It grows well on a block.

Odontoglossum Rossii (Ross's), is a dwarf species with pretty flowers, the sepals greenish yellow blotched with brown, the petals white with purple spots at the base, and the labellum white; native of Mexico.

Oncidium ampliatus major (broad lipped, large variety), has branching spikes of fine large bright yellow flowers, and is very showy; native of Guatemala. The *Oncidiums* are suitable for pot culture.

Oncidium bicallosum (two-warted), has a stout erect panicle of large yellow flowers tinged with green: it is a handsome species, and a native of Guatemala.

Oncidium Cavendishii (Duke of Devonshire's), has large yellow flowers mottled with brown; native of Mexico.

Oncidium concolor (one-coloured), is a dwarf-growing plant, producing a handsome spreading raceme of good sized entire yellow blossoms, which have a very showy appearance; native of the Organ Mountains.

Oncidium incurvum (incurved), has large branching panicles of flowers of a whitish colour, barred and blotched with deep lilac; native of Mexico.

Oncidium leucochilum (white lipped), has the flowers in long racemes; the sepals and petals yellowish green blotched with brown, the labellum large and white, slightly stained with rose colour; native of Guatemala.

Oncidium longifolium (long leaved), has curious roundish thong-like leaves, and an erect dense panicle of blossoms, white and yellow and reddish brown, the lip being

chiefly yellow; native of Mexico. The leaves are long and pendent; it is best suited for planting on a block.

Oncidium ornithorhynchum (bird-billed), has very pretty pinkish flowers with a perfume like new hay; native of Guatemala.

Oncidium roseum (rose-coloured), has brownish flowers, with a rose coloured labellum; native of Honduras.

Oncidium sphacelatum (scorched), has large branching panicles of gaily coloured flowers—yellow, the sepals, petals, and base of the lip marked with reddish brown; native of Mexico.

Oncidium spilopterum (spot-winged), has erect racemes of large, lipped, bright yellow blossoms, the sepals and petals being small, and of a reddish purple colour; native of Mexico. Synonyme—*O. gallopavinum*.

Oncidium Suttoni (Sutton's), has dull olive-brown flowers, with a yellow labellum; native of Guatemala.

Oncidium Wentworthianum (Wentworth's), has very long slender spikes of blossoms, of which the sepals and petals are green spotted with brown, and the lip yellow; native of Mexico.

Oncidium Wrayæ (Wray's), has bright yellow and brown flowers, with the labellum deep yellow; native of Mexico.

Renanthera coccinea (scarlet), has pale scarlet flowers, blotched with a deeper colour, and marked with yellow bands; often difficult to flower; native of China. It should be grown on a large trunk, against which, as it extends, it will adhere by its fleshy roots; it should be kept cool and dry in winter, placed in a temperature between stove and greenhouse in spring, and in summer brought near the glass to mature its growth.

Sobralia macrantha (large flowered), bears very large rich crimson flowers, of the most delicate texture; native of Guatemala. The *Sobralias* are of terrestrial habit, and should be grown in a pot.

Spathoglottis Fortuni (Mr. Fortune's), has a slender erect stem, bearing five or six moderate sized bright yellow flowers; native of the mountains of Hong Kong. This species is one of the terrestrial orchids, requiring to be planted in, not on the soil.

Stanhopea Bucephalus (bull-horned), has a drooping raceme with large singularly-formed, and deliciously fragrant, golden-yellow flowers, richly spotted with purple; native of the Andes, on the ascent from Guayaquil to Loxa, 6,000 feet above the sea. The *Stanhopeas* should be grown in loose open baskets, to admit of the flower spikes—which grow downwards—finding their way through; or, for the same reason, if planted in pots, they should be potted high. They are all fragrant.

Stanhopea Devoniensis (Duke of Devonshire's), has yellow flowers with deep crimson blotches, the labellum white, with a deep purple stain; native of Mexico.

Stanhopea inodora (scentless), has short drooping racemes of large pale lemon-coloured blossoms, with a blotch of orange on the lip; native of Mexico.

Stanhopea Martiana (Von Martius'), has the sepals straw-coloured, faintly dotted, the petals transparent white, with large spots of crimson; the labellum clear ivory white; native of Mexico.

Stanhopea oculata (eyed), has its flowers yellowish, beautifully spotted with small rings of deep purple, resembling eyes; the smell is very powerful—rather heavy; native of Mexico.

Stanhopea saccata (bagged), has straw-coloured petals and sepals, and orange labellum, beautifully and regularly speckled, but not blotched, with dark spots; native of Mexico.

Stanhopea tigrina (tiger-spotted), has very

large flowers, the sepals and petals pale yellow, blotched with dark sanguineous purple; the lip is very large, and more faintly dotted with purple; native of Mexico.

Stanhopea Wardii (Ward's), has flowers dull yellow, with a few spots of brown; the labellum dark blood colour, surrounded by a circle of bright orange; native of Central America.

Trichopilia tortilis (twisted), is a dwarf plant with pretty flowers, the divisions of which are brownish-yellow, and spirally twisted; the labellum white, with several distinct red spots; native of Mexico. This does well in a pot.

Vanda tessellata (tessellated), is a stiff, erect plant, with distichous leaves, producing short racemes of blossoms, which have the sepals and petals yellowish-green, blotched with red-brown inside, and the lip white, marked with rose-colour; native of China. It does best in a shallow pot, with the roots placed among sphagnum and peat.



FUCHSIA LOXENSIS.

Fuchsia loxensis, Humboldt, Bonpland and Kunth (*Loxa Fuchsia*).—Onagraceæ § Fuchseæ.

We have scarcely a more favourite race of flowers than the fuchsias. There are a great variety of species, which either are or have been cultivated in English gardens, and besides these, a much greater number originated by the energy of cultivators. Even now, novel species are from time to time introduced

from their several native countries; and of species already known to botanists many more, some of which are likely to prove ornamental, remain to be procured in a living state. The most recent accession to the list of cultivated fuchsias is one which bears some affinity with the present subject, and which Sir W. Hooker has named *Fuchsia spectabilis*; it is a very distinct and handsome kind, and has been obtained by Messrs. Veitch, of Exeter, who,

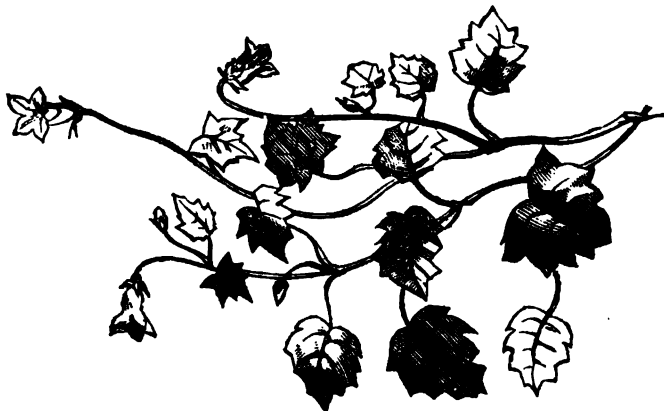
we believe, possess also some other novel-imported species.

Our engraving, prepared from the noble work on the plants of South America, by Humboldt, Bonpland, and Kunth, will convey a general idea of the appearance of this species. The necessary allowance must however be made, in order to appreciate its size. It is a somewhat robust growing shrubby kind, ranking in this respect with *fulgens*, *serratifolia*, and *corymbiflora* : it is not however reported to attain, even in its wild state, to any great altitude; from four to six feet being its recorded height. The stems are stout, erect, and to some extent hairy, and, we believe, not much branched. The leaves are large, in whorls, usually three in each whorl; they are of an oblong-elliptic, or lanceolate-oblong figure, acute at the apex, obsolete and remotely denticulated on the margin, shining, and of a rich dark green on the upper surface, and hairy on the veins beneath. The flowers proceed singly from the axils of the leaves, and grow each on a separate stalk; they are of a long tubular form, and assume a slightly pendent position. The tube of the corolla is slender, about three inches long, thickened

upwards, and of a rich purplish-crimson colour; the four calyx-lobes into which this tube divides at the apex are of the same colour, and of an acutely ovato-oblong form, projecting beyond the divisions of the corolla; the petals are individually of a roundish ovate form, and expand widely, forming a nearly circular face of somewhat less than an inch in diameter; the colour of the petals is a bright scarlet. The entire flower is very richly and brilliantly coloured.

This beautiful species is a native of Ecuador, where it has been found growing, near Loxa, at an elevation of 1,060 hexapods. It is probable that it may already exist in this country, among the unbloomed novelties imported by the enterprising nurserymen, Messrs. Veitch, of Exeter, who have obtained several fine subjects from the locality where this plant had been previously found. Should this not prove to be the case, it is worth the attention of collectors, or of those who may have correspondents in that part of South America.

As regards cultivation, this species would require treatment such as is applied to the larger growing kinds now in cultivation.



BRITISH WILD FLOWERS.

WAHLENBERGIA HEDERACEA.

Wahlenbergia hederacea, Reichenbach, (ivy-leaved Bell-flower.) — Campanulacæ & Lightfootæ.

This may be termed a neglected plant; those, indeed, who know it, are ready to acknowledge its beauty, but it is rarely met with in a cultivated state; and from the nature of the situations where it is naturally found, comparatively few persons have an opportunity of becoming acquainted with it. It grows only in damp places, such as bogs, and wet

banks and woods, where such only as the practical botanist would venture flower-seeking.

"Over the font's damp mossy stones they grew,
Luxuriantly,
Those little bells of faint and tender blue,
Which gracefully
Bent their small heads in every breeze which
stray'd,
From lawny sunshine to the woodland's shade."

The ivy-leaved bell-flower is one of those which silently bear witness to the imper-

fections of our present botanical systems, for while some regard it as a genuine *Campanula*, others doubt its genuineness, and some dissent so far as to place it in the genus *Wahlenbergia*, with which, indeed, it seems most fittingly to associate.

The species is a prostrate and trailing perennial plant, the thread-like angular stems of which spread extensively over the mossy surface of damp and peaty bogs, forming patches of a foot or more in diameter, and becoming much branched and entangled in their progress. The stems are furnished with smooth shining pale green leaves, which are of a rounded-cordate outline, angularly five-lobed on the margin, as in the case of the ivy, from which circumstance one of its names—*hederaacea*—is derived; they are attached to the stems by the intervention of long, slender, and angular footstalks. The flowers grow singly from the axils of the leaves, towards the ends of the branches, and these too are borne on the top of longish, slender, angular stalks; they are, in the young state, drooping, or nodding, but ultimately assume an erect position. The corolla is about half an inch long, bell-shaped, with the margin divided into five acute, spreading lobes, and is of a delicate light blue colour; it is succeeded by a smooth, nearly globular capsule or seed-vessel, to which the awl-shaped divisions of the calyx are attached. The capsule bursts open with three or five valves at the apex, within the calycine segments, in which respect it differs from *Campanula*, the capsules of which open by lateral pores outside the calycine segments. The blossoms are somewhat fugacious.

The natural places of its growth are bogs, damp woods, and banks, where it is continually, as well as abundantly, supplied with moisture. In these situations it produces its flowers pretty freely during the summer months, from about June to August. Growing over ornamental mossy rockwork, or on damp banks, it forms exceedingly elegant tufts, its delicate form, transparent texture, and beautiful blue blossoms, clothing what "otherwise would be naked and barren, with a varied tapestry" of inimitable design.

This plant might be made to answer various purposes in a flower garden. In any damp or shady situation, where the soil was of a spongy, boggy texture, it would thrive, the chief element of its existence being moisture: thus, wherever artificial rockwork is introduced to a garden, it may be appropriately accompanied by an artificial bog of greater or less

dimensions, in which might be collected all, or some of the more interesting, of the many bog plants, which are brimful of their own peculiar grace and beauty; in such a situation, the soil, formed of saturated peat-earth, overlaid with sphagnum moss, the *Wahlenbergia* would succeed well, planted as it were amongst the moss, over and amongst which it would extend itself. Associated with it might be grown the bog pimpernel, the bog asphodel, the sundews, the butterworts, the *parnassia*, the buckbean, and many others, all possessing the recommendatory qualities of curiosity or beauty. Skirting a walk through a wood where the soil is moderately light and damp, the *Wahlenbergia* might be introduced with perfect propriety, and every prospect of success. It grows freely in a shaded peat-earth border. Or it might be grown in pots or vases in peat-earth, the pots being placed by the edge of a fountain-basin, with the plants depending over their margins, and in such situations it would associate well with some of the dwarf, trailing habited lobelias, clintonias, and others of exotic origin. It may also be grown in a collection of dwarf perennial plants in pots. In this case a wide shallow pan, of a foot in diameter, and six inches deep, should be selected; the holes provided for drainage should be nearly closed up with clay, and then the pan filled up with turfy peat soil, with a layer of a couple of inches of sphagnum spread on the top, among which the *Wahlenbergia* is to be planted. It would be proper not to stop up all the holes with clay; one might be left open, in order that, in case of heavy rains, some of the excess of moisture might find egress, but the mass of soil should of course be kept thoroughly moistened at all times; in dry weather, therefore, considerable quantities of water would have to be applied. If thus kept well moistened, the plant will spread freely on the surface of the soil amongst the moss, covering the whole surface, and flowering freely. Nothing can be more easy than the matter of propagation; a portion of the plant taken as a cutting, with or without roots to its stem, and planted in any one of the situations which have been alluded to, will grow readily, requiring only at first a little attention to shading, if the situation be one at all exposed. In fact, the plant is capable of increase to any extent by the process of division.

It might be worth the experiment to hybridize this plant with some of the larger flowered species which are in cultivation.



NEW PEACHES.

Maid of Malines (Pêche Pucelle de Malines, of the French).—M. de Bavay, proprietor and director of the nurseries of Vilvorde, describes this variety as a tree of fertile, vigorous habit, with smooth branches, coloured deep red on the exposed side, and having small compressed buds. The leaves are long, smooth, and regularly and finely toothed. The fruit is large, but not always the same in form; sometimes it is almost round, and at other times oval; generally it is fuller in a horizontal direction, but sometimes longer than broad, with the top raised in the form of a small pointed tubercle. The skin is very delicate, and easily separated from the flesh; the surface uniformly streaked like marble, a little yellowish where shaded, and more or less red where exposed. The foot-stalk is short, and inserted in a deep cavity, which being the case, it often happens that the branch and the base of the fruit press against each other. The flesh is fine, rich, and juicy, of a white colour, tinged with a mixture of light green, except at the stone, where it is freely tinted with rose colour; the latter separates easily from the flesh; the juice, which is plentiful, has a most excellent taste, partaking of a vinous, sugary, and musky flavour. This peach is considered one of the best known. It ripens in the beginning of September, and is said to succeed in an east aspect, if planted in a light and warm soil; but where the soil is not so favourable, it requires a south aspect. In this country it will probably require a south aspect. It is stated not to thrive in an exposed situation. The variety was raised by the late Major Esperen of Malines, and is highly esteemed on the Continent. It is figured in the *Journal de Horticulture de Gand*.

Queen of Orchards (Pêche Reine des Vergers, of the French).—This peach, which was discovered about two years ago by Mr. Jamin of Lorès, in the department of Maine-et-Loire, is very highly spoken of in France. The wood of the tree is brown, and the young branches, which are vigorous and long, are of a deep violet colour; the stipules, the hinder part of the petiole, and the midrib of the leaf, are of the same colour; the petioles bear several (?) reniform glands. The fruit is large, upwards of five inches in diameter, purple where exposed, and golden-yellow at the other parts; in form somewhat oval, but depressed at the summit: the flesh is white, juicy, and fragrant, red round the stone, which is large, and plain on the surface. The fruit ripens in September, and will keep till the end of the month. It is figured in the

Portefeuille des Horticulteurs, (Dec. 1847.) In France it is very highly esteemed, being found to succeed admirably as a standard, as well as to produce abundantly fruit of large size, and excellent flavour. This character may, perhaps, not be maintained in our climate, which is less favourable than that of France for peach culture, but the variety will prove an acquisition, if it ripens well on an east or west aspect, or even if the tree is found to be more hardy than others on the south aspect, in unfavourable localities.

Gain de Montreuil.—This variety produces fruit of a roundish form, a little compressed, the transverse diameter being about three, and the longitudinal diameter four inches. The skin is thickly downy, very dark purple where exposed, and yellow finely dotted and streaked with purple on the shaded side. The flesh is veined with red, firm, and of very good flavour, adhering to the stone, which is of a deep purple. It is described in the *Bon Jardinier Almanach* for 1848.

NEW STRAWBERRIES.

The following new French varieties of the Strawberry are described in the *Bon Jardinier Almanach* for 1848:—

Compte de Paris.—The plant in this variety is dwarf, but of robust habit; the leaves have roundish leaflets with blunt serratures on the margin. The fruit is from three to three and a half inches in diameter, and is irregularly heart-shaped. The colour of the exterior is bright scarlet with the seeds slightly embedded; the flesh is pale red, with a separable spongy rose-coloured core surrounded by a zone of white. The scape is branched, bearing six or eight fruits.

Princesse Royale.—This variety is of vigorous habit; the leaves consist of tapering, sharply serrated leaflets. The fruit is from an inch to an inch and a half in length, and upwards of three inches in circumference, of an elongated conical form. The seeds are deeply embedded; the flesh is firm and solid, of a vinous flavour, very white at the core. The scape is slender, bearing eight or ten fruits.

Angelique Jamin.—This is a vigorous growing variety, and an abundant bearer. The fruit is of large size, and of an oval figure; the flesh very succulent, and of agreeable flavour, with a sugary slightly acidulated juice. It is said to have been raised from the well known and esteemed variety called Keens' Seedling.



ALPINE OR ROCK PLANTS.

THEIR CULTIVATION AND MANAGEMENT.

UNDER this title are included, first, those dwarf herbs and minute shrubs which actually inhabit Alpine districts, covering the mountain-tops with a carpet of vegetation, checquered with "flowers of all hues," and encroaching upon the empire of eternal snow; secondly, those dwarf herbs and minute shrubs which, though not naturally growing in such localities as the name implies, yet comport with them in size and in general appearance. The geographical botanist limits the meaning of the term to the former group, while the horticulturist includes under it the latter. In a gardening sense, therefore, Alpine plants are understood as comprising all dwarf hardy or nearly hardy perennial herbs, and such of the more minute shrubs as do not naturally fall into other groups—as American plants, for example; even in this respect there is no absolute line of demarcation.

CULTURE.

For the most part, Alpine plants may be cultivated without artificial protection, the natural circumstances attending their culture on rock-work being favourable to the endurance even of such species as may be barely hardy under other conditions; but notwithstanding this, when their cultivation is carried on with spirit, it is desirable, in the case of most of the smaller species, though they may be in general hardy enough to endure our

climate fully exposed, to keep a reserve plant of each, potted, and protected in frames in the winter; for sometimes a very severe, or oftener a very wet winter will materially injure, if not destroy, the less robust kinds. These smaller potted Alpine plants form a very neat and interesting group, requiring but little trouble; and in a good selection, one or other of the kinds will be almost always in bloom during the spring, summer, and autumn months. Many of the most minute of the plants of this character are, indeed, best grown entirely in pots, their small size rendering them less effective on rugged rockwork than when thus associated with kindred forms, in a neat and shady compartment, neatly potted from year to year, and kept of uniform size and appearance, as far as their habits will admit.

Potted Alpine plants ought to undergo a general revision, division, and repotting about the month of August; with a little attention they then become strong and well-established before winter. The pots—which look best when of uniform size—must be well drained with broken potsherds or rough charcoal; and they should, if practicable, be at all times plunged in some loose open material, such as fine cinder ashes, which acts as a protection to the roots, in winter, from the effects of cold, and in summer from the effects of drought, both of which are more or less hurt-

ful to them. In the summer these potted plants may occupy any shady, sheltered place, such, for example, as on the north side of a wall ranging east and west, or on either side of one ranging north and south; the first being, however, preferable in a general way. In the winter they may be placed in a pit of any kind, either of boards, bricks, or turf: no place is better for them than a well-made turf-pit; the only condition essential to success is that it should be well drained, so that no stagnant water beneath may injure or destroy the plants by the agency of accumulated damps. In these pits the pots should be plunged even or level with the rim, as already hinted. They do not require glass covers; wooden or any other waterproof covers are sufficient, these being used at night, and during severe weather, and at all times when rain is falling, for the plants should be kept moderately (not excessively) dry. At all other times—that is to say, when the atmosphere is dry or mild—the plants should remain fully exposed. In the very severe weather of midwinter, the whole of the plants may be covered over with a *loose layer*, six inches or a foot thick, of *dry tree-leaves*, which are to be removed on the return of warmer and more favourable weather. Kept in this way, they will seldom suffer.

In regard to watering, during winter, scarcely any should be applied, only enough to prevent them individually from becoming quite parched and dried up. Through the rest of the year, they need regular and liberal, but not excessive watering.

In the spring, such as may be required for the purpose, or can be spared from the duplicate store, should be planted out on the rockwork, where they will flourish during the summer season, and should be again either taken up for protection in the autumn, or left to the chances of exposure, according as they may be either hardy or tender, rare or plentiful. Those of the plants which permanently occupy the rockwork, should each year, on the return of spring, meet with some little attention, in the examination of their roots, and the addition of small portions of fresh soil where necessary and practicable. In the autumn, too, they should be looked to, for the purpose of removing the dead and decaying flower-stems, and giving them any necessary pruning and reduction; in this latter respect, however, they must not be too formally handled, for this would destroy the air of natural negligence which should at all times pervade scenes such as that which a rock-garden is intended to supply.

In planting rockwork, especially if it be constructed on a large scale, there are various kinds of shrubby plants of larger growth than

those which are usually included among Alpines, that should be introduced. Such are the various species of *Cistus*; several trailing species of *Genista*, and of *Juniperus*; a few of the narrow habited upright species of *Cupressus*; and any of the aloe-like *Yuccas*. The plants of the two latter groups must be more sparingly introduced than the others, and require also the exercise of a greater degree of correct taste in placing them, to produce a picturesque effect, than plants of the more ordinary range.

MONTHLY TREATMENT.

JANUARY.—The plants will now be in their winter quarters, as explained under December. Protection must be afforded them in proportion to the severity of the weather. If they are placed in a rough wooden or turf pit or frame, provided with wooden or thatched shutters as coverings, these will, in most cases, afford sufficient protection: in very severe weather they may be aided by the additional shelter of a layer of *dry tree-leaves* or fern, laid loosely directly over the plants, beneath the other coverings, and to be removed as soon as the weather becomes warmer. It is seldom that this additional covering is really necessary. When there is no frost, the coverings are to be removed entirely by day, except in case of rain, when the shutters are to be left on, and tilted up so as to admit as much air as practicable. The covers are better put on at night, in case of frost; but when there is little prospect of severe cold, they may be tilted up to allow as much fresh air as possible during the night. No water need be given, unless the season is very dry and mild, when perhaps some of the plants may become dry from frequent exposure, and need a small supply. In other cases none should be given, unless any individual plants are noticed to be drooping, when they may have a little. Any decaying portions that are observed should be removed.

FEBRUARY.—Many of the plants will begin to grow a little, if the season is mild. If it should be cold and frosty, the treatment of last month must be continued, but advantage should be taken of every opportunity, night and day, to expose the plants to the open air; for as they will many of them begin to grow with any increase of temperature that may transpire, the growth will be drawn up weakly, if they are not thus exposed. The plants may now be allowed to have a moderate share of mild rain; and if rain does not fall, they must be carefully watered, such of them as manifest any signs of drought. If the weather permits, remove all the coverings entirely, and expose the plants fully, which may be done whenever there is no frost.

MARCH.—The plants will now require a thorough revision. Where the pots have been plunged during the winter, they may now be taken up, and set rather more thinly, either in the same situation, or in a sheltered northern aspect. This may be delayed, if the weather proves cold. Any of the plants that are growing freely, and which it may be desirable to encourage, may, towards the end of the month, be transferred to pots a size larger than those they have been kept in through the winter, using the proper kind of soil for each. This will give them strength to bear their bloom. Those which by this time are almost in flower need not be disturbed, but should be allowed to perfect their bloom, and may then be repotted, with a view to excite further growth, and a later crop of flowers. Those which are not shifted should have the surface soil stirred up, or removed and replaced by fresh soil; but in doing this, the roots must not be injured. Rare and valuable kinds, which it is required to propagate, may now be divided, retaining some portion of the roots with each piece of the plant, carefully potting and watering them, and placing them for a week or two in a close frame, until established, when they may be placed with the others. If any slips or hearts of very rare kinds are broken off without roots, they may be planted like cuttings. All the plants will now require to be regularly watered in dry weather; and they ought to be sheltered, especially the early blooming ones, from frosts and very cold winds.

APRIL.—In this month, the directions given for March may be more fully carried out: repotting any plants which it is desired to encourage; dividing such as it may be desired to increase; and supplying all liberally with water. Propagation may go on extensively now: any of the shrubby or half-shrubby species may be increased by means of cuttings, made in the usual way, and planted in pots of sandy soil; the pots being set in a close frame, or plunged to the rim in sawdust or fine coal-ashes, under hand-glasses. Any of the herbaceous species may be divided, which should be done so that every piece into which the original plant is separated may have some portion of root attached: this may be done, with care, although it is sometimes tedious. The soil should be moderately dry, so that nearly or quite all of it may be shaken from among the roots, which may then be more readily separated in conjunction with that portion of the crown or of the branches with which they are more immediately connected: these roots are to be carefully preserved in repotting. The established plants may, towards the end of this month, be set out permanently in their summer quarters,

which should be in a sheltered northern or western aspect. Any temporary shelter afforded to plants growing permanently on the rockwork may now be removed. The plants may now be planted out where required; though, as the stock of Alpines is usually kept in pots, they may be safely planted out at any other season, when convenient; there is no better time, however, for general planting than the present month.

MAY.—The plants may now be all entirely and fully exposed, night and day, except that those of delicate constitution should be sheltered from heavy rains. Those growing on the rocks need no care; they will generally be moist enough from rains and dews, and their mode of growth should be in no way interfered with by tying, staking, or pruning; only, if weeds spring up, they may be removed; and if one plant is growing over and smothering another, one must be removed, or the interfering branches placed in another direction. The pot plants must be regularly watered, and propagation may go on as requisite.

JUNE.—Continue the treatment indicated for the last month. Collect seeds of desirable kinds as they ripen, and trim off decayed flower-stalks.

JULY.—The general treatment of the plants will be the same as that during May and June. Any seeds of choice plants should be gathered as they ripen. Towards the end of the month, seeds of any of the species which have been obtained may be sown, to provide flowering plants for the next season. They may be sown in rows across shallow wooden boxes, or in ordinary seed-pans, or in smaller quantities in shallow wide-mouthed pots, which are made for the purpose; those about six inches in diameter are a convenient size. In general, they are best sown in the boxes or the larger pans, as, from the greater body of soil, the roots of the young plants are less affected by cold and drought. Each should be sown in its proper soil, made rather finer and more sandy than usual; and the pots, pans, or boxes must be well drained with potsherds, and over them moss or rough soil; the surface should be made fine and even, and the seeds thinly distributed, and covered proportionately to their size—the larger ones, of the size of peas, about a quarter of an inch; those of the size of small shot, about the eighth of an inch; and all minute seeds, with a slight dusting of silver sand. After sowing, water moderately with a fine-rosed pot, and they may then be set in a cold frame with an eastern or western aspect, opening the frame a little every day, to purify the atmosphere, but keeping it generally closed until the seeds germinate; then give more and more air, gradu-

ally increasing it, and finally leaving the lights tilted night and day. When the seedlings are well up, and have formed a pair or two of perfect leaves, transplant them carefully to other pots or boxes, placing them an inch or two apart, according to their size.

AUGUST.—The general treatment must be continued as before. Any seeds which ripen early in the month may, if required, be sown at once. The later seeds must be reserved till next year, unless it is preferred to incur more trouble and risk for the sake of some rare or choice plant. The young seedlings from the sowings of last month may be transplanted, so as to give them more space; and these will now require, in other respects, the treatment of mature plants.

SEPTEMBER.—The out-door plants may now undergo a regular trimming, to remove all decayed and decaying stalks, and to prune back crowded or straggling branches. Delicate plants overgrown by more vigorous ones should be transplanted to more favourable situations. The trailing stemmed plants should be earthed up, so as to cover the naked parts or the bases of their stems, which will then throw out new and active roots; the plants will then be in better condition to withstand the cold of winter, and also to perfect their blooms in the next season. All the plants should be examined after heavy rains, to see that no stagnant water is retained about them; and if this is the case, a passage for its exit must be opened. The pot plants should be repotted early, and may generally be divided as directed in March: the choicer sorts should be so divided for the purpose of increase, and the commoner free-growing kinds to keep them within pot limits. If it is preferred to have a larger patch of any of the more ornamental kinds, they should, instead of being parted, be shifted into larger sized pots; a few pots so treated are very ornamental objects. After repotting, the plants may be placed again in a shady northern aspect, to remain until housed for the winter. They must be regularly watered as may be necessary. The earlier seedlings should be again transplanted, either into single pots, or more thinly into boxes or pans, or three or four into a pot, to stand the winter, and be planted out in the garden or rockery in spring.

OCTOBER.—Keep the plants moderately watered, and not too much crowded or shaded. If they can be brought to a south aspect, and allowed to get rather dry, it will assist to arrest and mature their growth, and will render them more rigid and hardy to withstand the cold and damp of winter. Get ready a frame or rough pit for their protection in winter; the bottom should be firm and dry—no stagnant water must be allowed

to collect; dry sawdust, old spent tanner's bark, or finely sifted coal ashes, are suitable materials in which to plunge the pots, and a supply should be got ready in a dry place.

NOVEMBER.—The plants may now be removed to their winter quarters, preparatory to being plunged, which may be done when convenient afterwards. They must not yet be covered, except to keep off heavy rains—it is best to keep them from becoming saturated by showers of rain, as the drier they are, in moderation, the more effectually will they withstand the damp atmosphere, and the low temperature to which they will be subsequently exposed. If the weather should become cold they may be protected at night, but do not keep them close.

DECEMBER.—If not already done, the pots may now be plunged to the level of their rims, in the material already provided. This prevents the soil from drying, so that less water is required to be given, and it also shelters the roots from the action of frost. The covers are to be put on only to keep off rain, and in case of severe cold; as a safeguard they are best put on at night, and tilted up, when the weather is not very severe: in the day time they should be off as much as possible. The degree of shelter afforded must be varied, as may be necessary; this is explained under January. Seed boxes or pans, in which the seeds have not yet vegetated, are to be set into cold frames, and well sheltered from frost; and the smaller seedling plants require rather more protection than those which are mature. Those plants in the descriptive list which are stated to require the shelter of a frame, are to be regarded as more tender than the ordinary plants, and to require more complete protection; they may be preserved in frames covered with glass sashes, and sheltered in severe weather by mats and other appliances. Any of the choice early-blooming plants in the rock garden may be slightly protected by artificial covers, removed when the weather is mild and dry.

SELECT AND DESCRIPTIVE LIST.

The accompanying list, though it by no means contains all the plants of this character which are known, and which might be recommended for rock-work under its various phases, is yet sufficiently extensive to afford considerable materials for selection, and in reality embraces all the more distinct, and the majority of the more ornamental kinds. Of many of the genera, however, there are numerous other kinds besides those here enumerated, which are equally worth cultivating; and indeed, many of those thus omitted may be individually more handsome than some of those included; their omission was, however,

rendered necessary by the endeavour to combine variety with beauty in the selection made. Of those genera which are most remarkable as containing other handsome kinds, we may especially instance—*Androsace*, *Arabis*, *Arenaria*, *Astragalus*, *Campanula*, *Dianthus*, *Draba*, *Helianthemum*, *Onosma*, *Primula*, *Saxifraga*, *Sedum*, *Sempervivum*, *Silene*, *Viola*, &c.; of many of these all the numerous species are individually worth growing, and are well adapted for situations of the kind under notice; we have, however, in most cases in our list, been only able to include three or four of the most distinct—not necessarily the most handsome.

ACHILLEA ALPINA, *Linnaeus* (alpine Milfoil).—*Asteraceæ* § *Tubulifloræ-Anthemidæ*.—A neat herbaceous perennial, growing about six inches high, with linear cut or comb-like leaves, and corymbs of white flowers. Native of Siberia. Introduced in 1731. Flowers in July. Also called *Ptarmica alpina* (De Candolle); *Achillea cristata* (Willdenow); and *A. punctata* (Moench). *Culture*.—Hardy; common soil; propagated by division.

ACHILLEA TOMENTOSA, *Linnaeus* (woolly Milfoil).—*Asteraceæ* § *Tubulifloræ-Anthemidæ*.—A pretty herbaceous perennial, growing about nine inches high, with doubly pinnatifid woolly leaves, and dense corymbs of yellow flowers. Native of Britain, and of southern Europe, and North America. Flowers in May and June. *Culture*.—Hardy; common soil; propagated by division.

ADONIS VERNALIS, *Linnaeus* (Spring Adonis).—*Ranunculaceæ* § *Anemoneæ*.—A pretty herbaceous perennial, attaining a foot in height, with sessile many-cut leaves, and terminal large yellow flowers. Native of Russia. Introduced in 1710. Flowers in April. Also called *A. apennina* (Jacquin), and *A. Helleborus* (Crantz). *Culture*.—Hardy; common soil; propagated by division.

ADYSETON SAXATILE, *Sweet* (rock Adyseton or Alyssum).—*Brassicaceæ* § *Pleurorhizæ-Alyssidæ*.—A very showy sub-shrubby plant, growing about a foot high, with hoary lance-shaped leaves, and numerous racemes of yellow flowers. Native of Russia. Introduced in 1710. Flowers in April. Also called *Alyssum saxatile* (Linnaeus). *Culture*.—Hardy; common soil; propagated by cuttings. Forms an excellent spring-flowering bed in the flower garden, for which purpose the plants are best preserved in pots through the winter in frames.

ÆTHIONEMA MEMBRANEUM, *De Candolle* (membraneous *Æthionema*).—*Brassicaceæ* § *Notorhizæ-Lepididæ*.—A neat little sub-shrubby plant, growing about six inches high, with small scattered linear leaves, and spikes of purplish cruciferous flowers. Native

of Persia. Introduced in 1828. Flowers in June and July. It is the *Lepia membranacea* (Desvaux). *Culture*.—Hardy; common soil; propagated by seeds or cuttings.

AJUGA BRACTEOSA, *Wallich* (bracteated Bugle).—*Lamiaceæ* § *Ajugeæ*.—A neat herbaceous perennial, growing six inches high, with broad ovate leaves, and spiked whorls of blue flowers. Native of Nepal. Introduced in 1821. Flowers in July. Also called *A. integrifolia* (Don). *Culture*.—Hardy; common soil; propagated by division.

AJUGA LAXMANNI, *Bentham* (Laxmann's Ground-pine).—*Lamiaceæ* § *Ajugeæ*.—A pretty herbaceous perennial, growing one foot high, with entire stalkless, elliptic leaves, and yellow flowers borne in whorls of two together. Native of Hungary. Introduced in 1800. Flowers in June. Also known as *Teucrium Laxmanni* (Linnaeus); and *Phleboanthe Laxmanni* (Tausch). *Culture*.—Hardy; common soil; propagated by division.

ALCHEMILLA ALPINA, *Linnaeus* (alpine Lady's-mantle).—*Sanguisorbaceæ*.—A neat little herbaceous perennial, growing about four inches high, with five seven-lobed fingered leaves, and corymbs of greenish inconspicuous flowers. Native of Britain, of Europe, and North America. Flowers in July. Also called *A. argentea* (Lamarck). *Culture*.—Hardy; common soil; propagated by division.

ANDROSACE CARNEA, *Linnaeus* (blush-coloured *Androsace*).—*Primulaceæ* § *Primulidæ*.—A pretty little herbaceous perennial of about three inches high, with scattered linear ciliated leaves, and umbels of flesh-coloured flowers. Native of the Alps of Europe. Introduced in 1768. Flowers in July. Also called *Aretea Halleri* (Linnaeus). *Culture*.—Should be kept in pots in a frame; well drained turfy peat and sandy loam; propagated by division or by seeds.

ANDROSACE CHAMEJASME, *Wulfen* (ground-jasmine *Androsace*).—*Primulaceæ* § *Primulidæ*.—A pretty little herb of about three inches high, with fringed lance-shaped leaves, and umbels of pink flowers. Native of Europe and Asia Minor. Introduced in 1768. Flowers in June. Called *A. villosa* (Jacquin); *A. acutifolia* (Turtsch); and *A. Lehmanniana* (Sprengel). *Culture*.—Should be grown in pots in a frame; well drained turfy peat and sandy loam; propagated by division or by seeds.

ANDROSACE LACTEA, *Linnaeus* (white-flowered *Androsace*).—*Primulaceæ* § *Primulidæ*.—A pretty herbaceous perennial, growing about six inches high, with linear entire leaves fringed at top, and umbels of white blossoms. Native of the Alps of Europe.

Introduced in 1752. Flowers in June. Also known as *A. pauciflora* (Villars), and *Primula lactea* (Lamarck). *Culture*.—Should be grown in pots in a frame; well drained turfy peat and sandy loam; propagated by division or by seeds.

ANDROSACE SARMENTOSA, *Wallich* (sarmentose Androsace).—*Primulaceæ* § *Primulidæ*.—A very beautiful little herbaceous perennial, growing six inches high, with ovate lance-shaped hairy leaves, and roundish heads of pink flowers. Native of the Himalayas. Introduced in 1842. Flowers in August. Also called *A. lanuginosa* (Wallich). *Culture*.—Should be grown in pots in a frame; well drained turfy peat and sandy loam; propagated by division or by seeds.

ANDROSACE VILLOSA, *Linnaeus* (shaggy-leaved Androsace).—*Primulaceæ* § *Primulidæ*. A pretty little herbaceous perennial, growing about three inches high, with lance-shaped entire leaves, and umbels of pink flowers. Native of the Alps of Europe. Introduced in 1790. Flowers in June. Also called, *A. incana* (Lamarck); *A. capitata* (Willdenow); and *Primula villosa* (Lamarck). *Culture*.—Should be grown in pots in a frame; well drained turfy peat and sandy loam; propagated by division or by seeds.

ANEMONE RANUNCULOIDES, *Linnaeus* (crow-foot-like Wind-flower).—*Ranunculaceæ* § *Anemoneæ*.—A pretty herbaceous perennial, growing six inches high, with tuberous roots, three or five-parted deeply toothed leaves, and one or two bright yellow cup-shaped blossoms. Native of Britain, Europe, and Siberia. Flowers in March and April. Also called, *A. flava* (Gilibert); *A. lutea* (Lamarck); and *A. nemorosa lutea* (Crantz). *Culture*.—Hardy; common soil; propagated by division.

ANTENNARIA ALPINA, *Gaertner* (Alpine Antennaria).—*Asteraceæ* § *Tubulifloræ-Antennariæ*.—A neat herbaceous perennial, growing three inches high, with lance-shaped entire leaves, and spikes of pink flowers. Native of Europe. Introduced in 1775. Flowers in June. It is the *Gnaphalium alpinum* (Linnaeus). *Culture*.—Hardy; common soil; propagated by division.

ANTENNARIA DIOICA, *Gaertner* (dioecious-flowered Antennaria).—*Asteraceæ* § *Tubulifloræ-Antennariæ*.—A small herbaceous perennial of three inches high, with spoon-shaped entire leaves, and dense corymbs of pink flowers. Native of Britain, Europe, and Siberia. Flowers in May. Also called *Gnaphalium dioicum* (Linnaeus). *Culture*.—Hardy; common soil; propagated by division.

ANTHEMIS TOMENTOSA, *Linnaeus* (downy Chamomile).—*Asteraceæ* § *Tubulifloræ-Anthemideæ*.—A small herbaceous perennial of

six inches high, with pinnate snow-white leaves, and white flowers, mostly solitary. Native of the south of Europe. Introduced in 1795. Flowers in July. Also called, *Anacyclus tomentosus* (De Candolle); *A. pubescens* (Reichenbach); and *Anthemis pubescens* (Willdenow). *Culture*.—Hardy; common soil; propagated by division.

ANTHYLLIS ERINACEA, *Linnaeus* (hedgehog Kidney-vetch).—*Fabaceæ* § *Papilionaceæ-Trifoliæ*.—A spiny shrub, growing nine inches high, with few oblong leaves, and heads of purplish flowers. Native of Spain and Barbary. Introduced in 1759. Flowers in May. *Culture*.—Requires a frame; sandy dry soil; propagated by seeds or cuttings.

ANTHEMIS MONTANA, *Linnaeus* (mountain Kidney-Vetch).—*Fabaceæ* § *Papilionaceæ-Trifoliæ*.—A neat herbaceous perennial, growing three inches high, with pinnate leaves, and one-sided heads of purple flowers. Native of Europe. Introduced in 1759. Flowers in June. Also called, *Barba jovis montana* (Mönch); and *Vulneraria montana* (Scopoli). *Culture*.—Hardy; dry sandy soil; propagated by seeds or by division.

ANTIRRHINUM ASARINA, *Linnaeus* (heart-leaved Snap-dragon).—*Scrophulariaceæ* § *Antirrhinidæ*.—A neat evergreen trailing herb, with opposite heart-shaped lobed leaves, and large white solitary flowers. Native of South of Europe. Introduced in 1699. Flowers in June. Also called, *Asarina cordifolia* (Mönch); *A. procumbens* (Miller); and *Orontium Asarina* (Persoon). *Culture*.—Requires a frame; common soil; propagated by cuttings.

AQUILEGIA ALPINA, *Linnaeus* (alpine Columbine).—*Ranunculaceæ* § *Helleboreæ*.—A very showy herbaceous perennial, growing about one foot high, with deeply-lobed triternate leaves, and two or three large blue flowers. Native of the Alps of Europe and Siberia. Introduced in 1731. Flowers in May. *Culture*.—Hardy; common soil; propagated by division.

AQUILEGIA CANADENSIS, *Linnaeus* (Canadian Columbine).—*Ranunculaceæ* § *Helleboreæ*.—A very pretty herbaceous perennial, growing about a foot high, with three-parted triternate leaves, and large scarlet and yellow flowers. Native of North America. Introduced in 1640. Flowers in May. Also called, *A. elegans* (Salisbury); and *A. variegata* (Mönch). *Culture*.—Hardy; common soil; propagated by division.

AQUILEGIA LEPTOCERAS, *Fischer and Meyer* (slender-horned Columbine).—*Ranunculaceæ* § *Helleboreæ*.—A very pretty herbaceous perennial, growing about nine inches high, with triternate wedge-shaped lobed leaflets, and about two large violet and white flowers.

Native of Siberia. Introduced in 1838. Flowers in May. *Culture*.—Hardy ; common soil ; propagated by division.

ARABIS ALBIDA, *Stevens* (white-leaved Wall-cress).—Brassicaceæ § *Pleurorhizæ*-*Arabidæ*.—A pretty dwarf tufted evergreen herb, growing nine inches high, with oblong toothed downy leaves, and racemes of large white cruciferous flowers. Native of Tauria. Introduced in 1798. Flowers in February. Also called, *A. caucasica* (Willdenow) ; and *Cheiranthus mollis* (Hornemann). *Culture*.—Hardy ; common soil ; propagated by cuttings or division.

ARABIS UNDULATA, *Link* (waved-leaved Wall-cress).—Brassicaceæ § *Pleurorhizæ*-*Arabidæ*.—A neat little tufted evergreen herb, growing six inches high, with oblong toothed hairy leaves, and spikes of white cruciferous flowers. Native of Europe. Introduced in 1810. Flowers in May. Also called, *A. leptocarpæa* (Fischer). *Culture*.—Hardy ; common soil ; propagated by cuttings or division.

ARENARIA BALEARICA, *Linnaeus* (Balearic Sandwort).—Caryophyllaceæ § *Alsineæ*.—A neat small evergreen herb, forming a dense tuft of slender creeping stems about three inches high, with oval fringed leaves, and solitary white flowers profusely produced all over the plant. Native of the Balearic Isles. Introduced in 1787. Flowers in March and April. Also known as *A. muscoides* (Moench). *Culture*.—Hardy ; common soil ; propagated by division.

ARETIA ALPINA, *Linnaeus* (Alpine Aretia).—Primulaceæ § *Primulidæ*.—A very pretty little tufted herbaceous perennial, growing two inches high, with sharp linear leaves, and solitary pink flowers. Native of the Alps of Europe. Introduced in 1775. Flowers in May. Also known as *A. ciliata* (Loiseleur) ; *A. pubescens* (Loiseleur) ; *Androsace alpina* (Lamarck) ; *A. ciliata* (De Candolle) ; and *A. pubescens* (De Candolle). *Culture*.—Hardy ; sandy loam and peat ; propagated by division.

ARETIA HELVETICA, *Linnaeus* (Swiss Aretia).—Primulaceæ § *Primulidæ*.—A neat and pretty herbaceous perennial, growing about two inches high, with small imbricated crowded leaves, and sessile white flowers. Native of the Swiss Alps. Introduced in 1775. Flowers in May. Also known as *A. bryoides* (Loiseleur) ; *Androsace Aretia* (Deitrich) ; *A. diapsensia* (Villars) ; *A. helvetica* (Allioni) ; and *Diapsensia helvetica* (Linnaeus). *Culture*.—Hardy ; sandy loam and peat ; propagated by division.

ARETIA VITALLIANA, *Linnaeus* (Vital's Aretia).—Primulaceæ § *Primulidæ*.—A very pretty herbaceous perennial, growing three

inches high, with smooth crowded linear leaves, and solitary yellow flowers. Native of the Pyrenees. Introduced in 1787. Flowers in May. Also called, *Aretia rugosa* (Clairv.) ; *Androsace Vitaliana* (La Perouse) ; *A. Intea* (Lamarck) ; *Gregoria Vitaliana* (Duby) ; and *Primula Vitaliana* (Linnaeus). *Culture*.—Hardy ; sandy loam and peat ; propagated by division.

ARMERIA ALPINA, *Willdenow* (alpine Thrift).—Plumbaginaceæ § *Staticeæ*.—A pretty tufted herbaceous perennial, growing six inches high, with linear sharp-pointed grass-like leaves, and heads of purplish flowers. Native of the Alps of Europe. Introduced in 1790. Flowers in May. Also called, *Statice alpina* (Steudel) ; and *S. montana* (Miller). *Culture*.—Hardy ; sandy soil ; propagated by division.

ARTEMISIA GLACIALIS, *Linnaeus* (icy Wormwood).—Asteraceæ § *Tubulifloræ*-*Artemisiæ*.—A neat herbaceous perennial, growing six inches high, with deeply-cut palmate white leaves, and clusters of yellowish flowers. Native of the Alps of Europe. Introduced in 1739. Flowers in July. Also called, *Absinthium congestum* (Lamarck) ; and *A. glaciale* (Lamarck). *Culture*.—Hardy ; common soil ; propagated by division.

ASARUM VIRGINICUM, *Linnaeus* (Virginian Asarabacca).—Aristolochiaceæ. —A curious herbaceous perennial, growing about six inches high, with blunt heart-shaped leaves, and solitary brown curious-shaped blossoms. Native of North America. Introduced in 1759. Flowers in April and May. *Culture*.—Hardy ; common soil ; propagated by division.

ASPERULA ALPINA, *Bieberstein* (alpine Wood-roof).—Galiaceæ. —A neat herbaceous perennial, growing six inches high, with whorls of four sharp narrow leaves, and terminal cymes of white flowers. Native of Caucasus. Introduced in 1820. Flowers in June. Known also as *A. cynanchica* (Stevens). *Culture*.—Hardy ; common soil, and shady situation ; propagated by division.

ASTER ALPINUS, *Linnaeus* (alpine Starwort).—Asteraceæ § *Tubulifloræ*-*Astereæ*.—A pretty herbaceous perennial, growing nine inches high, with lance-spoon-shaped leaves, and solitary purple flowers. Native of the Alps of Europe and Asia. Introduced in 1658. Flowers in May. Also known as *A. hirsutus* (Host). *Culture*.—Hardy ; common soil ; propagated by division.

ASTER OBOVATUS, *Meyer* (obovate-leaved Starwort).—Asteraceæ § *Tubulifloræ*-*Astereæ*.—A pretty herbaceous perennial growing one foot high, spreading, with obovate blunt sessile leaves, and light purple flowers. Native of the South of Europe. Introduced in 1830. Flowers in July. Also called, *Rhinactina limonifolia* (Lessing). *Culture*.—

Hardy; common soil; propagated by division.

ASTRAGALUS LEONTINUS, *Jacquin* (lion's-tail Milk-vetch).—*Fabacæ* § *Papilionacæ*-*Astragalæ*.—A pretty evergreen trailing subshrub, with pinnate leaves, having blunt leaflets, and oblong spikes of blue flowers. Native of Austria and the Swiss Alps. Introduced in 1816. Flowers in May. *Culture*.—Hardy; dryish sandy soil; propagated by cuttings or seeds.

ASTRAGALUS TRAGACANTHA, *Linnaeus* (Tragacanth Milk-vetch).—*Fabacæ* § *Papilionacæ*-*Astragalæ*.—A neat shrubby plant growing nine inches high, with hoary pinnate leaves, and white blossoms growing about four together. Native of the shores of the Mediterranean. Introduced in 1640. Flowers in May. Also known as *A. massiliensis* (Lamarck); *A. aristatus* (Sieber); and *Tragacantha massiliensis* (Miller). *Culture*.—Requires slight protection; dryish sandy soil; propagated by cuttings or seeds.

ASTRAGALUS URALENSIS, *Linnaeus* (Uralian Milk-vetch).—*Fabacæ* § *Papilionacæ*-*Astragalæ*.—A pretty herbaceous perennial, growing three inches high, with silky pinnate leaves, and heads of yellow and purple blossoms. Native of Scotland and of Siberia. Flowers in May. Also called *Astragalus velutinus* (Sieber); and *Oxytropis uralensis* (De Candolle). *Culture*.—Hardy; sandy dryish soil; propagated by division.

ASTRANTIA MINOR, *Linnaeus* (smaller Master-wort).—*Apiacæ* § *Saniculidæ*.—A neat herbaceous perennial, growing six inches high, with palmate leaves having seven to nine segments, and umbels of white flowers. Native of the middle and south of Europe. Introduced in 1685. Flowers in May. Also called *A. digitata* (Mönch). *Culture*.—Hardy; common soil; propagated by division.

AUBRETIA DELTOIDEA, *De Candolle* (deltoid-leaved Aubretia).—*Brassicacæ* § *Pleurorhizæ*-*Alyssidæ*.—A pretty tufted evergreen herbaceous perennial, growing three inches high, with rhomboid toothed leaves, and racemes of showy purple cruciferous flowers. Native of Italy, Greece, and Asia Minor. Introduced in 1810. Flowers in March. Also called *A. floribunda* (Spach); *Alyssum deltoideum* (Linnaeus); *Fursetia deltoidea* (R. Brown); and *Vesicaria deltoidea* (Poirret). *Culture*.—Hardy; common soil; propagated by division or by cuttings.

AZALEA PROCUMBENS, *Linnaeus* (trailing Azalea).—*Ericacæ* § *Rhododendrea*.—A neat little shrub, growing about six inches high, with lance-shaped acute leaves, and heads of pink flowers. Native of Scotland, and of Europe and Siberia. Flowers in April. Also known as *Chamæcistus serpyllifolius* (Gray);

Chamaedon procumbens (Link); and *Loiseleuria procumbens* (Desvaux). *Culture*.—Hardy, requiring free air; sandy peat; propagated by division.

BALLOTA PSEUDO-DICTAMNUS, *Bentham* (bastard Dittany of Crete).—*Lamiacæ* § *Stachæ*-*Ballotidæ*.—A rather pretty shrub, growing a foot high, with roundish leaves covered with thick wool, and flowers white and red, growing in dense whorls. Native of Crete. Introduced in 1596. Flowers in July. Also called *Beringeria pseudo-dictamnus* (Link); *Marrubium pseudo-dictamnus* (Linnaeus); and *Mollucella fruticosa* (Forskall). *Culture*.—Requires slight protection; does well in a frame in winter; common loamy soil; propagated by cuttings or layers.

BELLIDIASTRUM MICHELII, *Cassini* (Micheli's Star-daisy).—*Asteracæ* § *Tubulifloræ*-*Asteræ*.—A neat little herbaceous perennial of about three inches high, with a tuft of obovate-oblong leaves, and white daisy-like flowers in solitary heads. Native of Europe. Introduced in 1570. Flowers in June. Known also as *Bellidiastrum montanum* (Hoppe); *Arnica Bellidiastrum* (Villars); *Aster Bellidiastrum* (Scopoli); *Doronicum Bellidiastrum* (Linnaeus); and *Margarita Bellidiastrum* (Gaudichaud). *Culture*.—Hardy; common soil; propagated by division.

BELLIS SYLVESTRIS, *Cyrilli* (wood Daisy).—*Asteracæ* § *Tubulifloræ*-*Bellidæ*.—A neat daisy-like evergreen tufted herbaceous perennial, growing three inches high, with toothed spoon-shaped leaves, and white flowers in solitary heads. Native of southern Europe. Introduced in 1797. Flowers in May. *Culture*.—Hardy; common soil; propagated by division.

BELLIUM MINUTUM, *Linnaeus* (dwarf Bellium).—*Asteracæ* § *Tubulifloræ*-*Bellidæ*.—A minute tufted herbaceous biennial, growing scarcely more than an inch high, with linear lance-shaped leaves, and numerous small white daisy-like heads of flowers. Native of the Levant. Introduced in 1772. Flowers in June. *Culture*.—Should be kept in pots; peat and sandy loam; propagated by division.

CALCEOLARIA FOTHERGILLII, *Aiton* (Fothergill's Slipper-wort).—*Scrophulariacæ* § *Antirrhinidæ*-*Calceolæræ*.—A very pretty herbaceous perennial, throwing up from a tuft of spoon-shaped leaves on short stalks, the large yellow and red blossoms. Native of the Falkland Isles. Introduced in 1777. Flowers in May and June. *Culture*.—Does best in a frame; turfy loamy soil; propagated by division.

CAMPANULA CÆSPITOSA, *Scopoli* (tufted Bell-flower).—*Campanulacæ* § *Campanulæ*.—A pretty evergreen herbaceous perennial, growing four inches high, with shining ovate-

toothed leaves, and terminal blossoms, which are either blue or white. Native of Europe. Introduced in 1813. Flowers in May. It is also called *Campanula Antirrhinum* (Schleicher); *C. Bellardi* (Allioni); *C. pumila* (Curtis); and *C. uniflora* (Schultes). *Culture*.—Hardy; common soil; propagated by division.

CAMPANULA FRAGILIS, *Cyrilli* (brittle Bell-flower).—*Campanulaceæ* § *Campanuleæ*.—A very pretty somewhat trailing evergreen herbaceous perennial, growing about six inches high, with roundish heart-shaped lobed leaves, and paniced large pale-blue flowers. Native of Italy. Introduced in 1826. Flowers in July. Also called *Campanula Cavolini* (Tenore); *C. corkslearifolia* (Vahl); and *C. crassifolia* (Nees). *Culture*.—Requires a frame; light loamy soil; propagated by division or by cuttings.

CAMPANULA PULLA, *Linnaeus* (russet Bell-flower).—*Campanulaceæ* § *Campanuleæ*.—A very pretty herbaceous perennial of about three inches high, with small ovate roundish toothed leaves, and solitary nodding large deep purple-blue flowers. Native of the Alps of Central Europe. Introduced in 1779. Flowers in June. *Culture*.—Hardy; common soil; propagated by division.

CAMPANULA GARGANICA, *Tenore* (Garganian Bell-flower).—*Campanulaceæ* § *Campanuleæ*.—A very pretty trailing herbaceous perennial, growing about six inches high, with heart-shaped lobed leaves, and numerous short racemes of blue flowers. Native of Dalmatia. Introduced in 1832. Flowers in June and July. Also called *Campanula Elatine* (Petagna); and *Wahlenbergia flaccida* (Presl). *Culture*.—Requires a frame; light loamy soil; propagated by cuttings.

CARDAMINE TRIFOLIA, *Linnaeus* (three-leaved Lady's-smock).—*Brassicaceæ* § *Pleurorhizæ-Arabidæ*.—A neat herbaceous perennial growing six inches high, with ternate toothed leaves, and white flowers borne on a naked stalk. Native of south of Europe. Introduced in 1620. Flowers in March. *Culture*.—Hardy; common soil; propagated by division.

CASTILLEJA PALLIDA, *Sprengel* (pale Castilleja).—*Scrophulariaceæ* § *Rhinanthidæ Euphrasieæ*.—A neat herbaceous perennial growing nine inches high, with linear pointed entire leaves, and simple spikes of pale purple flowers. Native of Labrador. Introduced in 1782. Flowers in July. Also called *Castilleja septentrionalis* (Lindley); and *Bartsia pallida* (Michaux). *Culture*.—Hardy, but apt to suffer injury from damps; sandy peat; propagated by division.

CEDRONELLA CORDATA, *Bentham* (heart-leaved Cedronella).—*Lamiaceæ* § *Nepetææ*.—

A pretty herbaceous perennial, growing six inches high, with heart-shaped crenate leaves, and spikes of large pale blue flowers. Native of North America. Introduced in 1824. Flowers in July. Also called *Dracocephalum cordatum* (Nuttall). *Culture*.—Hardy; common soil; propagated by division.

CERASTIUM TOMENTOSUM, *Linnaeus* (tomentose Mouse-ear-Chickweed).—*Caryophyllaceæ* § *Alsineæ*.—A neat herbaceous perennial, growing six inches high, with lanceolate leaves which are white with down, and paniced white flowers. Native of the south of Europe. Introduced in 1648. Flowers in June. Also called *Cerastium Columnæ* (Tenore). *Culture*.—Hardy; common soil; propagated by division.

CERINTHE ALPINA, *Kitaibel* (alpine Honeywort).—*Boraginaceæ* § *Anchusidæ*.—A neat herbaceous biennial growing about a foot high, with heart-shaped entire glaucous leaves, and spikes of yellow and purple flowers. Native of the Alps, of Hungary and the Tyrol. Introduced in 1804. Flowers in June. Also called *Cerinth maculata* (Allioni). *Culture*.—Hardy; common soil; propagated by seeds.

CHEIRANTHUS ALPINUS, *Linnaeus* (alpine Wall-flower).—*Brassicaceæ* § *Pleurorhizæ-Arabidæ*.—A very pretty evergreen sub-shrub, growing six inches high, with lance-shaped leaves, and racemes of large sweet bright sulphur-yellow flowers. Native of Norway. Introduced in 1820. Flowers in March and April. *Culture*.—Hardy; makes a beautiful early-flowering bed; common soil; propagated by cuttings.

CHEIRANTHUS OCHROLEUCUS, *Haller* (pale yellow Wall-flower).—*Brassicaceæ* § *Pleurorhizæ-Arabidæ*.—A very pretty evergreen sub-shrub, with lance-shaped toothed leaves, and spikes of pale yellow blossoms. Native of the Alps of Switzerland. Introduced in 1820. Flowers in April. Also known as *Cheiranthus decumbens* (Schleicher); *C. dubius* (Suter); and *Enysimum ochroleucum* (De Candolle). *Culture*.—Hardy; makes a good bed; common soil; propagated by cuttings.

CHIMAPHILA MACULATA, *Pursh* (spotted-leaved Winter-green).—*Pyrolaceæ*.—A rare and interesting evergreen herbaceous perennial, growing four inches high, with whorled lance-shaped leaves, and two or three terminal drooping pitcher-shaped white flowers. Native of North America. Introduced in 1752. Flowers in June. Also called *Pyrola maculata* (Linnaeus). *Culture*.—Hardy; but not easily cultivated; should be kept damp under a hand-glass in a cool place; turfy peat soil, not often disturbed; propagated by cuttings.

CHIMAPHILA UMBELLATA, *Nuttall* (umbel-flowered Winter-green).—*Pyrolaceæ*.—A rare

and interesting evergreen herbaceous perennial, growing four inches high, with whorled lance-shaped leaves, and five or six terminal drooping white blossoms. Native of North America. Introduced in 1752. Flowers in June. Also known as *Chimaphila corymbosa* (Pursh); and *Pyrola umbellata* (Linnaeus). *Culture*.—Hardy; but not easily cultivated; should be kept damp under a hand-glass in a cool place; turfy peat soil; propagated by cuttings.

CLAYTONIA VIRGINICA, *Linnaeus* (Virginian Claytonia).—Portulacææ.—A neat tuberous-rooted herbaceous perennial, growing four inches high, with spoon-shaped or oblong leaves, and racemes of pink flowers. Native of North America. Introduced in 1789. Flowers in April. *Culture*.—Hardy; peaty soil; propagated by offsets.

COCHLEARIA GRÆNLANDICA, *Linnaeus*.—Greenland Scurvy-grass.—Brassicææ § Pleurorhizææ—Alyssidææ.—A neat herbaceous perennial, growing three inches high, with entire kidney-shaped leaves, and racemes of white flowers. Native of Scotland, and northern Europe. Flowers in July. *Culture*.—Hardy; common soil; propagated by division.

CONVALLARIA BIFOLIA, *Linnaeus* (two-leaved Lily-of-the-valley).—Liliacææ § Asparagææ.—A very pretty herbaceous perennial, growing three inches high, with heart-shaped leaves clasping the stem, and small white flowers in racemes. Native of England, and of Europe and Siberia. Flowers in May. Also called *Convallaria quadrifida* (Lamarck); *Smilacina cordifolia* (Becker); *S. bifolia* (Ker); *Maianthemum bifolium* (De Candolle); *M. Convallaria* (Roth); *M. cordifolium* (Mœnch); *Sciophila convallarioides* (Wibel); *Styrandra bifolia* (Rafinesque). *Culture*.—Hardy; sandy loam, and a shady situation; propagated by division.

COPTIS TRIFOLIA, *Salisbury* (three-leaved Coptis).—Ranunculacææ § Helleborææ.—A neat herbaceous perennial, growing about two inches high, with trifoliate leaves formed of obovate blunt-toothed leaflets, and solitary white flowers. Native of northern Europe. Introduced in 1782. Flowers in April. Also called *Anemone grænlandica* (Eder); *Chrysa borealis* (Rafinesque); *Helleborus trifolius* (Linnaeus); *H. trilobus* (Lamarck); and *H. pumilus* (Salisbury). *Culture*.—Hardy; peaty soil; propagated by division.

CORIS MONSPELIENSIS, *Linnaeus* (Montpellier Coris).—Primulacææ § Primulidææ.—A very pretty biennial, growing six inches high, with bluntish linear leaves, and heads of lilac flowers. Native of Southern Europe. Introduced in 1640. Flowers in June. *Culture*.—Requires a frame; peat and loam, and a dryish situation; propagated by division.

CORNUS CANADENSIS, *Linnaeus* (Canadian Dogwood).—Cornacææ.—A neat herbaceous perennial, growing about six inches high, with whorls of ovate leaves, and small purplish-white blossoms. Native of North America. Introduced in 1774. Flowers in May. *Culture*.—Hardy; peaty soil; propagated by division.

CORTUSA MATTHIOLI, *Linnaeus*, (bear's-ear Sanicle).—Primulacææ § Primulidææ.—A pretty herbaceous perennial, growing four inches high, with heart-shaped lobed leaves, and umbels of red blossoms. Native of Austria and Siberia. Introduced in 1596. Flowers in April. *Culture*.—Does best in a frame; peat and loam; propagated by division.

CORYDALIS NOBILIS, *Persoon* (noble Corydalis).—Fumariacææ § Fumariææ.—A pretty tuberous rooted herbaceous perennial, growing nine inches high, with cut bipinnate leaves, and racemes of pale yellow flowers which have a long spur. Native of Siberia. Introduced in 1783. Flowers in May. It is the *Fumaria nobilis* (Jacquin); *F. sativa* (Scopoli); and *Cypnoides nobilis* (Mœnch). *Culture*.—hardy; common soil; propagated by division.

CRUCIANELLA STYLOSA, *Trinius* (long-styled Crosswort).—Galiacææ.—A pretty procumbent evergreen herbaceous perennial, with rough linear pointed leaves growing in star-like whorls, and dense heads of pink blossoms. Native of Northern Persia. Date of introduction not known. Flowers in June and July. Also called *Asperula ciliata* (De Candolle); and *Laxmannia fasciculata* (Gmelin). *Culture*.—Nearly or quite hardy; common soil; propagated by cuttings or rooted layers.

CYCLAMEN COUM, *Miller* (round-leaved Sow-bread).—Primulacææ § Primulidææ.—A beautiful tuberous rooted herbaceous perennial, growing about two inches high, with entire roundish heart-shaped leaves, and numerous solitary red blossoms. Native of Europe. Introduced in 1596. Flowers in March. *Culture*.—Hardy; peat and loam; propagated by seeds.

CYCLAMEN NEAPOLITANUM, *Tenore* (Neapolitan Sow-bread).—Primulacææ § Primulidææ.—A very pretty tuberous-rooted herbaceous perennial, with heart-shaped lobed leaves, and numerous solitary white blossoms. Native of Southern Europe. Introduced in 1596. Flowers in September. Known also as *Cyclamen hederæfolium* (Aiton); *C. autumnale* (Boos); and *C. europæum* (Savi). *Culture*.—Hardy; peat and loam; propagated by seeds.

DIANTHUS ALPINUS, *Linnaeus* (Alpine Pink).—Caryophyllacææ § Silenacææ.—A

very pretty tufted evergreen herbaceous perennial, growing three inches high, with oblong blunt leaves, and solitary red flowers. Native of Austria. Introduced in 1759. Flowers in June. *Culture*.—Hardy. dryish sandy loam; propagated by seeds and cuttings.

DIANTHUS DELTOIDEUS, *Linnaeus* (Maiden Pink).—Caryophyllaceæ § Sileneæ.—A pretty little tufted evergreen herbaceous perennial, growing from six to nine inches high, with long narrow glaucous leaves, and solitary rose-coloured flowers, which have a dark circle. Native of Britain and of Europe. Flowers in July. It is the *Dianthus crenatus* (Gilibert); *D. supinus* (Lamarck); and *Caryophyllus deltoideus* (Möench). *Culture*.—Hardy; sandy soil; propagated by cuttings or by seeds.

DIANTHUS SUPERBUS, *Linnaeus* (superb Pink).—Caryophyllaceæ § Sileneæ.—A pretty evergreen herbaceous perennial, growing eighteen inches high, with narrow glaucous leaves, and panicles of large lilac blossoms, the petals of which are deeply jagged. Native of Europe. Introduced in 1596. Flowers in July. Also called *Dianthus fimbriatus* (Lamarck); *D. multifidus* (Gilibert); *D. plumarius* (Gunner); and *Caryophyllus superbus* (Möench). *Culture*.—Hardy; sandy loamy soil; propagated by cuttings or by seeds.

DIAPENSIA LAPPONICA, *Linnaeus* (Lapland Diapensia).—Diapensiaceæ.—An interesting little tufted evergreen herbaceous perennial, growing about an inch high, with narrow spoon-shaped leaves, and solitary comparatively large pure white flowers. Native of Lapland and North America. Introduced in 1801. Flowers in March. It is the *Diapensia obtusifolia* (Pursh). *Culture*.—Does best in a frame; suffers from damp; peat soil; propagated by seeds or by division.

DIELYTRA SPECTABILIS, *De Candolle* (showy Dielytra).—Fumariaceæ § Fumariæ.—A showy herbaceous perennial, growing six or eight inches high, with multifid deeply cut leaves, and large purple drooping flowers in fastigate panicles. Native of Siberia. Introduced in 1816. Flowers in May. Also known as *Fumaria spectabilis* (Linnaeus); *Corydalis spectabilis* (Persoon); and *Capnorchis spectabilis* (Borckhausen). *Culture*.—Hardy; light rich soil; propagated by division.

DIGITALIS MINOR, *Lindley* (smaller Fox-glove).—Scrophulariaceæ § Rhinanthideæ Digitalæ.—A pretty herbaceous perennial, growing nine inches high, with flat lance-shaped leaves, and racemes of large purplish blossoms. Native of Spain. Introduced in 1789. Flowers in June. *Culture*.—Nearly

hardy; common soil; propagated by division or by seed.

DRABA AIZOIDES, *Linnaeus* (aizoon-like Whitlow-grass).—Brassicaceæ § Pleurorhizææ Alyssidæ.—A very neat tufted evergreen herbaceous perennial, growing about two inches high, with linear ciliated leaves, and heads of yellow blossoms. Native of Wales and of Europe. Flowers in March. Also called *Draba alpina* (Crantz); *D. ciliaris* (Salisbury); *D. montana* (Berger); *Alyssum ciliatum* (Lamarck); and *Moenchia aizoides* (Roth). *Culture*.—Hardy; loam and peat; propagated by division.

DRACOCEPHALUM ALTAIENSE, *Laxmann* (Altaian Dragon's-head).—Lamiaceæ § Nepetææ.—A very showy herbaceous perennial, growing nine inches high, with oblong blunt leaves, and heads of very large blue flowers. Native of Siberia. Introduced in 1787. Flowers in July. Also called *Dracocephalum grandiflorum* (Linnaeus). *Culture*.—Hardy; common soil; propagated by division.

DRACOCEPHALUM BOTRYOIDES, *Steven* (botrys-like Dragon's-head).—Lamiaceæ § Nepetææ.—A pretty trailing herbaceous perennial, with ovate roundish cut downy leaves, and spikes of whorled purple flowers. Native of the Caucasus. Introduced in 1822. Flowers in July. It is the *Nepeta pinnatifida* (Fischer). *Culture*.—Hardy; common soil; propagated by division or by cuttings.

DRYAS OCTOPETALA, *Linnaeus* (eight-petalled Dryas).—Rosaceæ § Potentillidæ.—A very elegant sub-shrub of prostrate habit, with ovate serrate leaves, and solitary white rose-like flowers. Native of Britain, and also of Europe, Asia, and America. Flowers in June. Also known as *Geum chamædrifolium* (Möench). *Culture*.—Hardy; peaty soil; propagated by cuttings or division.

DRYPIS SPINOSA, *Linnaeus* (spiny Drypis).—Caryophyllaceæ § Sileneæ.—A very pretty small evergreen shrub, growing six inches high, with stiff awl-shaped leaves, and corymbs of pale blue flowers. Native of Italy. Introduced in 1775. Flowers in June. *Culture*.—Nearly hardy; peat and sandy loam; propagated by cuttings.

ECHIMUM MERTENSII, *Lehmann* (Mertens' Viper's Bugloss).—Boraginaceæ § Anchusidæ.—A pretty herbaceous perennial, growing nine inches high, with narrow lance-shaped leaves, and dense spikes of blue flowers. Native of Spain. Introduced in 1824. Flowers in June. Also called *Echium albicans* (Lagasca). *Culture*.—Hardy; common soil; propagated by cuttings.

EMPETRUM NIGRUM, *Linnaeus* (Black Crowberry).—Empetraceæ.—A small tufted evergreen shrub, growing a foot high, with dense linear-oblong leaves, and inconspicuous purple

flowers. Native of Britain, and of Europe and Asia. Flowers in April. *Culture*.—Hardy; sandy or boggy soil; propagated by layers or by division.

EPIMEDIUM MACRANTHUM, *Lindley* (large-flowered Barren-wort).—*Berberidaceæ* § *Nandineæ*.—A beautiful herbaceous perennial, growing six inches high, with compound leaves formed of nine heart-shaped toothed leaflets, and racemes of pale violet flowers. Native of Japan. Introduced in 1834. Flowers in April. Known also as *Epimedium grandiflorum* (Siebold).—*Culture*.—Does best in a frame; sandy peat; propagated by division.

EPIMEDIUM VIOLACEUM, *Morren* (violet-coloured Barren-wort).—*Berberidaceæ* § *Nandineæ*.—A beautiful herbaceous perennial, growing six inches high, with leaves composed of three heart-shaped leaflets, and racemes of pretty violet-coloured flowers. Native of Japan. Introduced in 1834. Flowers in April. *Culture*.—Does best in a frame; sandy peat; propagated by division.

ERANTHIS SIBIRICUS, *De Candolle* (Siberian Winter Aconite).—*Ranunculaceæ* § *Helleboreæ*.—A pretty tuberous-rooted herbaceous perennial, growing two or three inches high, with two opposite sessile leaves cut into narrow segments, forming a fringe around the base of the solitary yellow flower. Native of Siberia. Introduced in 1826. Flowers in March. Also called *Helleborus sibiricus* (Sprengel); and *Trollius sibiricus* (Reichenbach). *Culture*.—Hardy; common soil; propagated by division.

ERIGERON ALPINUM, *Linnaeus* (alpine Erigeron).—*Asteraceæ* § *Tubulifloræ-Erigeronæ*.—A neat herbaceous perennial, growing nine inches high, with lance-shaped leaves, and purple flowers in solitary heads. Native of Scotland, and of Europe and Siberia. Flowers in July. Called also *Stenactis alpina* (Cassini). *Culture*.—Hardy; common soil; propagated by division.

ERINUS ALPINUS, *Linnaeus* (alpine Erinus).—*Scrophulariaceæ* § *Rhinanthideæ*.—A very pretty evergreen herbaceous plant, growing three inches high, with tufted serrate hairy leaves, and purple flowers in short spikes. Native of the Alps of Europe. Introduced in 1739. Flowers in April. *Culture*.—Hardy; light sandy soil; propagated by division.

ERINUS HISPANICUS, *Persoon* (Spanish Erinus).—*Scrophulariaceæ* § *Rhinanthideæ*.—A pretty evergreen herbaceous perennial, growing two inches high, with tufted bluntly serrate leaves, and purple flowers growing in long spikes. Native of Spain. Introduced in 1739. Flowers in April. *Culture*.—Hardy; light sandy soil; propagated by division.

ERPETION RENIFORMIS, *Sweet* (kidney-

leaved Erpetion).—*Violaceæ* § *Violeæ*.—A pretty little creeping herbaceous perennial, with kidney-shaped toothed leaves, and numerous small solitary blue-and-white blossoms. Native of New Holland. Introduced in 1823. Flowers in May. Also called *Erpetion hederacea* (Don); and *Viola hederacea* (Labillardière). *Culture*.—Requires a frame; sandy peat soil; propagated by division.

EUPHORBIA VENETA, *Willdenow* (Venetian Euphorbia).—*Euphorbiaceæ* § *Euphorbieæ*.—A neat sub-shrub, growing about eighteen inches high, with linear lance-shaped leaves, and dense spikes of green flowers. Native of Italy. Introduced in 1824. Flowers in June. *Culture*.—Requires a frame; common soil; propagated by cuttings.

FRANKENIA CORYMBOSA, *Desfontaines* (corymboso-flowered Sea-heath).—*Frankeniaceæ*.—A neat sub-shrub, growing six inches high, with clustered linear glabrous leaves, and small rose-coloured flowers in terminal corymb. Native of Spain and Barbary. Introduced in 1823. Flowers in June. It is the *Frankenia revoluta* (Forskahl). *Culture*.—Nearly hardy; peat and sandy loam; propagated by division.

GALAX APHYLLA, *Linnaeus* (leafless-stalked Galax).—*Pyrolaceæ*.—An interesting herbaceous perennial, growing six inches high, with heart-shaped crenate leaves, which all spring from the root, and spikes of white flowers. Native of North America. Introduced in 1786. Flowers in June. Known also as *Galax rotundifolia* (Pursh); *Erythrorhiza rotundifolia* (Michaux); *Pyrola urceolata* (Poirret), and *Solenandra cordifolia* (Andrews). *Culture*.—Hardy; peaty soil, and moist situation; propagated by division.

GERANIUM ARGENTUM, *Linnaeus* (silvery-leaved Crane's-bill).—*Geraniaceæ*.—A pretty herbaceous perennial, growing three inches high, with silky leaves divided into five or seven lobes, and large pale red-striped flowers, growing on two-flowered axillary peduncles. Native of the south of Europe. Introduced in 1699. Flowers in June. *Culture*.—Hardy; common soil; propagated by cuttings.

GERANIUM SANGUINEUM, *Linnaeus* (bloody-flowered Crane's-bill).—*Geraniaceæ*.—A very pretty herbaceous perennial, growing one foot high, with leaves divided into five or seven lobes, and large crimson flowers on long stalks, from the axils of the leaves. Native of Britain, and of Europe and Siberia. Flowers in July. *Culture*.—Hardy; common soil; propagated by cuttings.

GENISTA ANGLICA, *Linnaeus* (Petty Whin).—*Fabaceæ* § *Papilionaceæ-Cytisæ*.—A very pretty spiny shrub, growing about a foot high, with oblong smooth glaucous leaves, and ra-

cemes of yellow flowers. Native of Britain and Germany. Flowers in May. Also called *Genista minor* (Lamarck). *Culture*.—Hardy; common soil; propagated by cutting or layers.

GENTIANA ALPINA, *Villars* (Alpine Gentian).—*Gentianaceæ* § *Gentianeæ*.—A pretty herbaceous perennial, growing three inches high, with blunt ovate nerveless leaves, and solitary large blue flowers. Native of the Alps of Europe. Introduced in 1817. Flowers in May. Also called *Gentiana excisa* (Preat); *Ericala alpina* (G. Don); and *Hippion alpinum* (Schmidt.) *Culture*.—Hardy; peaty soil, not often disturbed; propagated by division.

GENTIANA FIMBRIATA, *Willdenow* (fringe-flowered Gentian).—*Gentianaceæ* § *Gentianeæ*.—A pretty evergreen herbaceous perennial, growing six inches high, with lance-shaped leaves, and large solitary fringed blue flowers. Native of Caucasus. Introduced in 1818. Flowers in August. Known also as *Gentiana ciliata* (Bieberstein); and *Gentianella fimbriata* (G. Don). *Culture*.—Hardy; peaty soil, not often disturbed; propagated by division.

GENTIANA VERNA, *Linnaeus* (spring Gentian).—*Gentianaceæ* § *Gentianeæ*.—A very beautiful little tufted evergreen herbaceous perennial, growing about two inches high, with ovate-acute crowded leaves, and solitary large deep blue flowers. Native of England, and of Europe and the Caucasus. Flowers in April. Also called *Ericala verna* (G. Don); *Ericoila verna* (Borckhausen); and *Hippion vernum* (Schmidt). *Culture*.—Hardy; peaty soil, not often disturbed; propagated by division.

GENTIANA VERNA, *var. alba* (white spring Gentian).—*Gentianaceæ* § *Gentianeæ*.—A very pretty little tufted evergreen herbaceous perennial, growing about two inches high, with ovate acute leaves, and solitary large white flowers. Native of Britain and of Europe. Flowers in April and May. *Culture*.—Hardy; peat soil, not often disturbed; propagated by division.

GENTIANA SEPTEMFIDA, *Pallas* (seven-lobed-flowered Gentian).—*Gentianaceæ* § *Gentianeæ*.—A very beautiful evergreen herbaceous plant, growing nine inches high, with blunt ovate lance-shaped leaves, and from five to seven large blue dotted flowers. Native of Russia and the Caucasus. Introduced in 1804. Flowers in June. Also known as *Eurythalia septemfida* (Borckhausen); and *Pneumonanthe septemfida* (Schmidt.) *Culture*.—Hardy; peat soil, not often disturbed; propagated by division.

GLOBULARIA VULGARIS, *Linnaeus* (common Globularia).—*Selaginaceæ*.—A pretty little

evergreen herbaceous perennial, growing six inches high, with longish three-toothed leaves, and dense heads of blue flowers. Native of Europe. Introduced in 1640. Flowers in May. *Culture*.—Hardy; sandy-peaty soil; propagated by division.

GRATIOLA AUREA, *Muhlenberg* (golden flowered Hedge-hyssop).—*Scrophulariaceæ* § *Antirrhinidæ*-*Eugratiolæ*.—A prostrate growing herbaceous perennial, with broadly-linear sessile leaves, and downy axillary yellow flowers. Native of North America. Introduced in 1820. Flowers in May. *Culture*.—Hardy; rich moist soil; propagated by division.

GYPSOPHILA PROSTRATA, *Linnaeus* (prostrate stemmed Gypsophila).—*Caryophyllaceæ* § *Sileneæ*.—A neat prostrate growing herbaceous perennial, with smooth linear leaves, and panicles of flesh-coloured flowers. Native of Asia Minor. Introduced in 1802. Flowers in July. Known also as *Gypsophila thesifolia* (Seringe). *Culture*.—Hardy; light dryish soil; propagated by cuttings or by seeds.

HACQUETIA EPIPACTIS, *De Candolle* (dwarf Hacquetia).—*Apiaceæ* § *Saniculidæ*.—A singular-looking dwarf herbaceous perennial, growing about three inches high, with palmately-cut radical leaves, and small yellow flowers in umbels. Native of Austria. Introduced in 1823. Flowers in March. Also called *Astrantia Epipactis* (Linnaeus); and *Dondia Epipactis* (Sprengel.) *Culture*.—Hardy; loam and peat; propagated by division.

HEDYOTIS CÆRULEA, *Hooker* (blue-flowered Hedyotis).—*Cinchonaceæ* § *Cinchoneæ*-*Hedyotidæ*.—A very neat and pretty evergreen herbaceous perennial, growing three or four inches high, with small egg-shaped leaves, and numerous bluish-lilac flowers on branching stems. Native of North America. Introduced in 1758. Flowers in May. It is the *Houstonia cærulea* (Linnaeus); *H. grandiflora* (Rafinesque); *H. Linnei* (Michaux); *Anonymus erecta* (Walter); and *Poiretia erecta* (Gmelin). *Culture*.—Does best in a frame; sandy peat soil, well drained; propagated by division.

HELIANTHEMUM CUPREUM, *Sweet* (copper-coloured Sun-rose).—*Cistaceæ*.—A beautiful procumbent sub-shrub, with oblong lance-shaped leaves, and racemes of large copper-coloured, somewhat fugacious flowers. Perhaps a garden hybrid. Flowers in June. *Culture*.—Hardy, though a reserve should be protected in a frame; light dry common soil; propagated by cuttings.

HELIANTHEMUM GRANDIFLORUM, *De Candolle* (great flowered Sun-rose).—*Cistaceæ*.—A handsome procumbent sub-shrub, with

flattish oblong leaves, and racemes of large fugacious cream-coloured flowers. Native of the Pyrenees. Introduced in 1800. Flowers in June. *Culture*.—Hardy; but a reserve should be protected in a frame; light dry common soil; propagated by cuttings.

HELLEBORUS ODORUS, *Waldstein* (sweet scented Hellebore).—*Ranunculaceæ* § *Helleboreæ*.—A neat herbaceous perennial, growing a foot high, with a branching stem, palmate hairy leaves, and large green blossoms. Native of Hungary. Introduced in 1817. Flowers in March. *Culture*.—Hardy; common soil and shady situation; propagated by division.

HIERACIUM AUGUSTIFOLIUM, *Hoppe* (narrow-leaved Hawkweed).—*Asteraceæ* § *Ligulifloræ* - *Hieraciæ*.—A pretty herbaceous perennial, growing three inches high, with linear lance-shaped hairy leaves, and heads of yellow composite flowers, growing in threes. Native of the Alps of Europe. Introduced in 1823. Flowers in May. Also called *Hieracium Auricula* (Smith), and *H. glaciale* (Lachenal). *Culture*.—Hardy; common soil; propagated by division.

HIERACIUM AUREUM, *Scopoli* (golden Hawk-weed).—*Asteraceæ* § *Ligulifloræ* - *Hieraciæ*.—A pretty herbaceous perennial, growing six inches high, with smooth lance-shaped toothed leaves, and solitary heads of yellow composite flowers. Native of Italy. Introduced in 1769. Flowers in May. Also called, *Crepis aurea* (Cassini); *Andryala aurea* (Scopoli); *Apargia aurea* (Hoppe); *Calliopia aurea* (Don), and *Leontodon aureus* (Linnaeus). *Culture*.—Requires slight protection; common soil; propagated by division.

HIPOCREPIS HELVETICA, *G. Don* (Swiss Horse-shoe Vetch).—*Fabaceæ* § *Papilionaceæ* - *Coronillæ*.—A pretty prostrate herbaceous perennial, with pinnate leaves, having obovate leaflets, and yellowish flowers in heads. Native of Switzerland. Introduced in 1819. Flowers in May. *Culture*.—Hardy; light sandy soil; propagated by seeds or division.

HORMINUM PYRENAICUM, *Linnaeus* (Pyrenean Horminum).—*Lamiaceæ* § *Monardeæ* - *Horminidæ*.—A beautiful herbaceous perennial, growing nine inches high, with ovate blunt notched leaves, and long spikes of purple labiate flowers. Native of the Alps of Europe. Introduced in 1820. Flowers in June. Also called, *Melissa pyrenaica* (Jacquin). *Culture*.—Hardy, but suffers from damp in winter unless protected; common soil; propagated by division.

HOSACKIA BICOLOR, *Douglas* (two-coloured Hosackia).—*Fabaceæ* § *Papilionaceæ* - *Trifoliceæ*.—A pretty herbaceous perennial, growing nine inches high, with pinnate leaves, and

umbels of yellow and white blossoms. Native of California. Introduced in 1823. Flowers in July. It is the *Lotus pinnatus* (Hooker). *Culture*.—Hardy; common soil; propagated by division.

HUTCHINSIA ALPINA, *R. Brown* (Alpine Hutchinsia).—*Brassicaceæ* § *Notorhizæ* - *Lepididæ*.—A neat little evergreen herbaceous perennial, growing two inches high, with smooth pinnate-parted leaves, and racemes of white flowers. Native of the Alps of Europe. Introduced in 1775. Flowers in April. Also called *Lepidium alpinum* (Linnaeus); *L. Halteri* (Crantz); and *Draba alpina* (Baumgarten). *Culture*.—Hardy; common soil; propagated by division.

HUTCHINSIA ROTUNDIFOLIA, *R. Brown* (round-leaved Hutchinsia).—*Brassicaceæ* § *Notorhizæ* - *Lepididæ*.—A neat little tufted evergreen herbaceous perennial, growing a couple of inches high, with obovate fleshy leaves, and racemes of purplish flowers. Native of the Alps of Europe. Introduced in 1759. Flowers in April. It is the *Lepidium rotundifolium* (Allioni). *Culture*.—Hardy; common soil; propagated by division.

HYPERICUM ELEGANS, *Stephan* (elegant St. John's Wort).—*Hypericaceæ* § *Hypericæ*.—A pretty herbaceous perennial, growing one foot high, with blunt ovate lanceolate leaves, and yellow blossoms in spikes. Native of Siberia and Bohemia. Introduced in 1817. Flowers in June. Known also as *Hypericum anagallidifolium* (Presl); *H. Kohlianum* (Sprengel); and *H. pulchrum* (Pallas). *Culture*.—Hardy; common soil; propagated by division.

IBERIS GIBALTARICA, *Linnaeus* (Gibraltar Candytuft).—*Brassicaceæ* § *Pleurorhizæ* - *Thlaspidæ*.—A very handsome tufted evergreen sub-shrub, growing about six inches high, with blunt wedge shaped leaves, and dense corymbs of large white flowers. Native of Spain. Introduced in 1782. Flowers in May. Also known as *Iberis dentata* (Mœnch); and *I. speciosa* (Salisbury). *Culture*.—Best preserved in a frame in winter; common soil; propagated by cuttings.

IBERIS TENOREANA, *De Candolle* (Tenore's Candy-tuft).—*Brassicaceæ* § *Pleurorhizæ* - *Thlaspidæ*.—A very handsome tufted evergreen sub-shrub, growing six inches high, with fleshy obovate leaves, and umbels of purplish blossoms. Native of Naples. Introduced in 1822. Flowers in May. Also called *Iberis Tenorii* (Presl); *I. cepaeifolia* (Tenore); and *I. pilosa* (Desvaux). *Culture*.—Nearly or quite hardy; common soil; propagated by cuttings.

IONOPSIDIUM ACAULE, *Reichenbach* (stemless Violet-cress).—*Brassicaceæ* § *Notorhizæ* - *Lepididæ*.—A very pretty little annual herb

(self-sowing), growing two inches high, with small blunt heart-shaped leaves, and numerous solitary violet-coloured cruciferous flowers. Native of Portugal. Introduced in 1845. Flowers in May. Also known as *Cochlearia acaulis* (Desfontaines); *C. pusilla* (Brotero); and *Lepidium violiforme* (De Candolle). *Culture*.—Hardy; light sandy soil and shady situation; propagated by seeds, which sow themselves among the rockwork when once established.

JASIONE PERENNIS, *Lamarck* (perennial Sheep's Scabious).—*Campanulacæ* § *Jasioneæ*.—A very ornamental herbaceous perennial, growing about a foot high, with rather hairy obovate leaves, and close heads of blue flowers. Native of the South of Europe. Introduced in 1787. Flowers in June. Also called *Jasione laevis* (Lamarck). *Culture*.—Requires a frame in winter, and protection from damps; sandy peaty soil; propagated by division.

JEFFERSONIA DIPHYLLO, *Persoon* (two-leaved Jeffersonia).—*Berberidacæ* § *Nandineæ*.—A neat and interesting herbaceous perennial, growing about four inches high, with two deeply divided leaves, and solitary white flowers. Native of North America. Introduced in 1792. Flowers in April. Known also as *Jeffersonia Bartonis* (Michaux); and *Podophyllum diphyllum* (Linnaeus). *Culture*.—Hardy; common soil; propagated by division.

LEONTODON SQUAMOSUS, *Lamarck* (scaly-headed Dandelion).—*Asteracæ* § *Ligulifloræ-Lactucæ*.—A neat herbaceous perennial, growing nine inches high, with lance-shaped toothed leaves, and yellow flowers in solitary heads. Native of the Alps of Europe. Introduced in 1816. Flowers in May. Also called *Leontodon alpinus* (Jacquin); *L. pyrenaicus* (Gouan); *Apargia alpina* (Willdenow); *A. pyrenaica* (Suter); *Hedypnois pyrenaica* (Villars); and *Picris saxatilis* (Allioni). *Culture*.—Hardy; common soil; propagated by division.

LINARIA ALPINA, *Desfontaines* (alpine Toad-flax).—*Scrophulariacæ* § *Antirrhinidæ-Antirrhineæ*.—A very pretty little evergreen prostrate herbaceous perennial, with thickish blunt linear leaves, and racemes of blue and orange flowers. Native of the Alps of Europe. Introduced in 1570. Flowers in June. It is the *Antirrhinum alpinum* (Linnaeus). *Culture*.—Should be kept in a frame in winter; sandy loam; propagated by division, or by cuttings.

LINARIA PILOSA, *Bivona Bernardi* (pilose Toad-flax).—*Scrophulariacæ* § *Antirrhinidæ-Antirrhineæ*.—A neat, dense growing evergreen herbaceous perennial, of prostrate habit, with kidney-shaped lobed leaves, and solitary purple and yellow flowers. Native

of Sicily. Introduced in 1800. Flowers in June. Known also as *Linaria pubescens* (Presl); and *Antirrhinum pubescens* (Tenore). *Culture*.—Should be kept in a frame in winter; sandy loam; propagated by division or by cuttings.

LINARIA SUPINA, *Desfontaines* (trailing Toad-flax).—*Scrophulariacæ* § *Antirrhinidæ-Antirrhineæ*.—A prostrate evergreen herbaceous perennial, with linear blunt glaucous leaves, and large yellow blossoms, growing in racemes. Native of the South of Europe. Introduced in 1728. Flowers in June. Also called *Linaria filiformis* (Mönch); and *Antirrhinum supinum* (Linnaeus). *Culture*.—Best kept in a frame in winter; sandy loam; propagated by division or cuttings.

LINARIA TRISTIS, *Miller* (sad-flowered Toad-flax).—*Scrophulariacæ* § *Antirrhinidæ-Antirrhineæ*.—A curious prostrate evergreen herbaceous perennial, with linear oblong blunt leaves, and racemes of dull looking, blackish brown flowers. Native of Spain. Introduced in 1722. Flowers in July. Also called *Antirrhinum triste* (Linnaeus); and *A. ærugineum* (Gouan). *Culture*.—Best kept in a frame in winter; sandy loam; propagated by cuttings or division.

LINNÆA BOREALIS, *Linnaeus* (northern Linnaea).—*Caprifoliacæ* § *Lonicercæ*.—A very pretty and interesting trailing evergreen herbaceous perennial, with roundish ovate crenate leaves, and flesh-coloured drooping flowers, growing in pairs. Native of Scotland, and of Europe, and North America. Flowers in May. *Culture*.—Hardy; peat soil and shady situation; propagated by division.

LINUM AUSTRIACUM, *Linnaeus* (Austrian flax).—*Linacæ*.—A very pretty herbaceous perennial, growing about a foot high, with sharp-pointed lance-shaped leaves, and large pale, bluish-purple flowers. Native of Austria. Introduced in 1775. Flowers in June. It is the *Linum angustifolium* (Loddiges). *Culture*.—Best preserved in a dry frame in winter; sandy loam; propagated by seeds or cuttings.

LINUM FLAVUM, *Linnaeus* (yellow Flax).—*Linacæ*.—A very pretty, diffuse growing herbaceous perennial, growing nearly a foot high, with narrow lance-shaped leaves, and large yellow blossoms. Native of Southern Europe. Introduced in 1793. Flowers in June. *Culture*.—Best protected in a dry frame in winter; sandy loam; propagated by cuttings.

LITHOSPERMUM GRAMINIFOLIUM, *Viviani* (grass-leaved Gromwell).—*Boraginacæ* § *Anchusidæ*.—A neat little herbaceous perennial, growing six inches high, with long linear leaves, and spikes of blue flowers. Native of Austria and Italy. Introduced in 1825.

Flowers in May. It is also called *Lithospermum fruticosum* (Vittmann); and *Pulmonaria suffruticosa* (Linnæus). *Culture*.—Hardy; common soil; propagated by division.

LOTUS CORNICULATUS FLORE-PLENO (double-flowered bird's-foot Trefoil).—*Fabaceæ* § *Papilionaceæ-Trifoliæ*.—A beautiful little trailing evergreen herbaceous perennial, with leaves formed of three oval leaflets, and numerous heads of double yellow blossoms. Native of Britain, and of Europe. Flowers in June. *Culture*.—Hardy; dry loamy soil; propagated by cuttings.

LYCHNIS ALPINA, *Linnæus* (alpine Lychnis).—*Caryophyllaceæ* § *Sileneæ*.—A pretty little evergreen herbaceous perennial, growing six inches high, with tufted lance-shaped leaves, and dense heads of pink flowers. Native of Scotland, of the Alps of Europe, and of North America. Flowers in June. Also called *Viscaria alpina* (Don); and *V. helvetica* (Don). *Culture*.—Hardy; light, rich, loamy soil; propagated by frequent division.

MECONOPSIS CAMBRICA, *Viguier* (Welsh Poppy).—*Papaveraceæ*.—A pretty herbaceous perennial, growing a foot high, with numerous pinnate toothed leaves, and large solitary yellow blossoms. Native of Wales and the Pyrenees. Flowers in May. Also called *Stylophorum cambricum* (Sprengel); and *Papaver cambricum* (Linnæus). *Culture*.—Hardy; light rich soil; propagated by seeds.

MEDEOLE VIRGINICA, *Linnæus* (Virginian Medeola).—*Trilliaceæ*.—A pretty herbaceous perennial, growing nine inches high, with whorls of lance-shaped leaves, and umbels of yellowish flowers. Native of North America. Introduced in 1759. Flowers in June. Also called *Gyromia virginica* (Nuttall). *Culture*.—Hardy; light sandy soil; propagated by division.

MITCHELLA REPENS, *Linnæus* (creeping Mitchellia).—*Cinchonaceæ* § *Coffeæ-Guettardidæ*.—A neat trailing evergreen herbaceous perennial, with roundish glabrous leaves, and whitish blossoms, growing two together. Native of North America. Introduced in 1761. Flowers in June. *Culture*.—Hardy; sandy peat soil; propagated by division.

MITELLA DIPHYLLA, *Linnæus* (two-leaved Mitella).—*Saxifragaceæ*.—A pretty little herbaceous perennial, growing six inches high, with heart-shaped lobed serrated leaves, and racemes of neat white blossoms. Native of North America. Introduced in 1731. Flowers in April. *Culture*.—Hardy; peaty soil; propagated by division.

MOEHRINGIA MUSCOSA, *Linnæus* (mossy Moehringia).—*Caryophyllaceæ* § *Alsineæ*.—A neat little herbaceous perennial, growing three inches high, with linear glabrous sheath-

ing leaves, and small white solitary flowers. Native of Europe. Introduced in 1775. Flowers in June. *Culture*.—Hardy; sandy loam and peat; propagated by division.

MONESIS GRANDIFLORA, *Salisbury* (large flowered Winter-green).—*Pyrolaceæ*.—A very pretty little herbaceous perennial, growing about four inches high, with roundish serrated leaves, growing in whorls, and large solitary white flowers. Native of Britain and of Europe, Asia, and America. Also called *Pyrola uniflora* (Linnæus). *Culture*.—Hardy; but somewhat difficult to grow; peaty soil, shaded; propagated by division.

MULGEDIUM MACRORHIZON, *Royle* (large-rooted Mulgede).—*Asteraceæ* § *Ligulifloræ-Hieraciæ*.—A pretty herbaceous perennial, growing about one foot high, with pinnate-lobed leaves, and panicles of blue flowers. Native of Thibet. Introduced in 1845. Flowers in September. *Culture*.—Hardy, but liable to suffer material injury from damp in winter; sandy loam and peat, propagated by cuttings, or by seeds.

MYOSOTIS NANA, *Villars* (dwarf Mouse-ear).—*Boraginaceæ* § *Anchusidæ*.—A pretty tufted evergreen herbaceous perennial, growing two inches high, with silky lance-shaped leaves and racemes of large blue flowers. Native of the Alps of Europe. Introduced in 1800. Flowers in May. It is also called *Myosotis pauciflora* (Vittmann); and *Eritrichium nanum* (Schrader). *Culture*.—Hardy; light moist soil; propagated by division.

MYOSOTIS PALUSTRIS, *Withering* (true Forget-me-not).—*Boraginaceæ* § *Archusidæ*.—A very pretty herbaceous perennial, growing one foot high and upwards, with lance-shaped leaves, and scorpoid racemes of blue flowers with a yellow centre. Native of Britain, and of Europe, Asia, and America. Flowers in the summer. Also called *Myosotis perennis* (Mœnch); and *Echioides palustris* (Mœnch). *Culture*.—Hardy; requires common soil and moist situation; propagated by division.

MYOSOTIS RUPESTRIS, *Pallas* (rock Mouse-ear).—*Boraginaceæ* § *Anchusidæ*.—A very pretty evergreen tufted herbaceous perennial, growing four inches high, with linear silky leaves, and deep-blue flowers in scorpoid racemes. Native of Davuria. Introduced in 1802. Flowers in July. Also called *Myosotis pauciflora* (Ledebour); *Anchusa rupestris* (Schultes); and *Eritrichium rupestre* (Bunge). *Culture*.—Hardy; light moist soil; propagated by division.

CENOTHERA ACAULIS, *Cavanilles* (stemless Evening Primrose).—*Onagraceæ* § *Epilobææ*.—A pretty biennial herb, growing six inches high, with pinnatifid leaves, and large white blossoms. Native of Chili. Introduced in 1821. Flowers in May. It is the *Cenothera*

taraxacifolia (Sweet); *Æ. anisoloba* (Sweet); *Æ. grandiflora* (Ruiz and Pavon); and *Lavauxia nutica* (Spach). *Culture*.—Hardy; common soil; propagated by seeds.

ENOTHERA MISSOURIENSIS, *Sims* (Missouri Evening Primrose).—*Onagraceæ* § *Epilobææ*.—A very showy herbaceous perennial of spreading habit, growing about six inches high, with tapering lance-shaped leaves, and large yellow blossoms. Native of North America. Introduced in 1818. Flowers in June. *Æ. macrocarpa* (Pursh); differs chiefly in having broader leaves. *Culture*.—Hardy; common soil; propagated by cuttings.

ONOSMA ORIENTALIS, *Linnaeus* (eastern Onosma).—*Boraginaceæ* § *Anchusidæ*.—A pretty tufted herbaceous perennial, growing six inches high, with lance-shaped leaves, and yellow blossoms in racemes. Native of the Levant. Introduced in 1752. Flowers in May. It is the *Cerinthe orientalis* (Linnaeus). *Culture*.—Hardy; sandy soil; propagated by cuttings or by seeds.

ONOSMA STELLULATA, *Waldstein and Kitabel* (starry-haired Onosma).—*Boraginaceæ* § *Anchusidæ*.—A pretty herbaceous perennial growing six inches high, with blunt lance-shaped leaves, and terminal drooping yellow blossoms. Native of Austria. Introduced in 1811. Flowers in April. It is the *Onosma montana* (Gaudichaud); *O. orientalis* (Hablitz); and *O. taurica* (Pallas). *Culture*.—Hardy; sandy soil; propagated by cuttings or by seeds.

OXALIS VIOLACEA, *Linnaeus* (violet-flowered Wood-sorrel).—*Oxalidaceæ*.—A very pretty herbaceous perennial, growing three inches high, with smooth trifoliate leaves, and pretty pink blossoms. Native of North America. Introduced in 1772. Flowers in May. It is the *Sassa tinctoria* (Molina). *Culture*.—Hardy; turfy peat and sandy loam; propagated by division of offsets.

PAPAVER ALPINUM, *Linnaeus* (alpine Poppy).—*Papaveraceæ*.—A very pretty herbaceous perennial, growing six inches high, with smoothish bipinnate leaves, and solitary white flowers. Native of the Alps of Europe. Introduced in 1759. Flowers in June. *Culture*.—Hardy; light rich soil; propagated by division or seeds.

PAPAVER NUDICAULE, *Linnaeus* (naked-stemmed Poppy).—*Papaveraceæ*.—A very pretty herbaceous perennial, growing six inches high, with acute pinnately-toothed leaves, and solitary yellow flowers. Native of Europe, north of Asia, and America. Introduced in 1730. Flowers in June. Called also the *Papaver radicatum* (Rottboell). *Culture*.—Hardy; light rich soil; propagated by division or by seeds.

PARNASSIA PALUSTRIS, *Linnaeus* (Grass of Parnassus).—*Hypericaceæ* § *Elodææ*.—A pretty herbaceous perennial, growing six inches high, with heart-shaped leaves, and large white flowers. Native of Britain, and of Europe, and North America. Flowers in September. Also called *Parnassia europæa* (Persoon); and *P. vulgaris* (Courset). *Culture*.—Hardy; moist peaty soil; propagated by division.

PENTHORUM SEDIOLDES, *Linnaeus* (stonecrop-like Penthorum).—*Crassulaceæ* § *Diamorpheæ*.—A neat herbaceous perennial, growing a foot high, with lance-shaped serrate leaves, and cymes of pale yellow flowers. Native of North America. Introduced in 1768. Flowers in July. *Culture*.—Hardy; sandy soil; propagated by division.

PENTSTEMON CRASSIFOLIUS, *Lindley* (thick-leaved Pentstemon).—*Scrophulariaceæ* § *Antirrhinidæ* - *Chelonææ*.—A beautiful evergreen subshrub, growing one foot high, with obovate lance-shaped leaves, and spikes of blue flowers. Native of North America. Introduced in 1830. Flowers in June. *Culture*.—Hardy; loamy soil; propagated by cuttings.

PHACA ASTRAGALINA, *De Candolle* (milk-vetch Phaca).—*Fabaceæ* § *Papilionaceæ* - *Astragaleæ*.—A very pretty herbaceous perennial, growing one foot high, with pinnate leaves, and blue flowers in drooping racemes. Native of Europe. Introduced in 1771. Flowers in June. Also known as *Phaca minima* (Villars); *Astragalus alpinus* (Linnaeus); *A. minimus* (Linnaeus); *A. montanus* (Jacquin); and *Colutea astragalina* (Poiret). *Culture*.—Hardy; common soil; propagated by seeds, and division.

PHLOMIS ARMENIACA, *Willdenow* (Armenian Phlomis).—*Lamiaceæ* § *Stachææ* - *Balotidæ*.—A pretty herbaceous perennial, growing about nine inches high, with heart-shaped crenate leaves, and whorls of yellow flowers. Native of Armenia. Introduced in 1834. Flowers in June. *Culture*.—Hardy; light rich soil; propagated by division.

PHLOX CANADENSIS, *Sweet* (Canadian Phlox).—*Polemoniaceæ*.—A beautiful little herbaceous perennial, growing about a foot high, with broadly lance-shaped leaves, and heads of showy flowers of a pretty light-blue colour. Native of North America. Introduced in 1825. Flowers in April. *Culture*.—Hardy; rich loam and peat; propagated by division or by cuttings.

PHLOX NIVALIS, *Sweet* (snowy-flowered Phlox).—*Polemoniaceæ*.—A very pretty trailing evergreen herbaceous perennial, with small narrow leaves growing in bundles, and white blossoms growing by threes. Native of North America. Introduced in 1820. Flowers in April. *Culture*.—Benefited by

the protection of a frame in winter ; rich loam and peat ; propagated by cuttings.

PHLOX PILOSA, *Linnaeus* (pilose Phlox).—Polemoniaceæ.—A very pretty herbaceous perennial, nine inches high, with short narrow lance-shaped leaves, and bunches of purple flowers. Native of North America. Introduced in 1759. Flowers in June. Also called *Phlox amœna* (Sims). *Culture*.—Hardy ; good loam, and peat ; propagated by division.

PHLOX PROCUMBENS, *Lehmann* (procumbent Phlox).—Polemoniaceæ.—A very pretty evergreen herbaceous perennial, growing about six inches high, with sharp lance-shaped leaves, and umbels of pale pink blossoms. Native of North America. Introduced in 1827. Flowers in May. *Culture*.—Hardy ; good loam and peat ; propagated by cuttings or division.

PHLOX REPTANS, *Michaux* (creeping Phlox).—Polemoniaceæ.—A pretty trailing herbaceous perennial, with ovate blunt spoon-shaped leaves, and corymbs of rosy-coloured flowers. Native of North America. Introduced in 1800. Flowers in June. It is also called *Phlox obovata* (Muhlenberg) ; *P. prostrata* (Aiton) ; and *P. stolonifera* (Sims). *Culture*.—Hardy ; rich loam and peat ; propagated by cutting or by runners.

PHLOX SETACEA, *Linnaeus* (setaceous-leaved Phlox).—Polemoniaceæ.—A very pretty evergreen trailing herbaceous perennial, with bundles of awl-shaped leaves, and terminal pale rose-coloured flowers. Native of North America. Introduced in 1786. Flowers in April. *Culture*.—Benefited by the protection of a frame in winter ; rich loam and peat ; propagated by cuttings.

PHLOX SUBULATA, *Linnaeus* (awl-leaved Phlox).—Polemoniaceæ.—A very pretty trailing evergreen herbaceous plant, having narrow sharp awl-shaped leaves, and corymbs of pink flowers. Native of North America. Introduced in 1786. Flowers in April. *Culture*.—Benefited by the protection of a frame in winter ; good loam and peat ; propagated by cuttings.

PHYTEUMA COMOSUM, *Linnaeus* (tufted Rampion).—Campanulaceæ & Campanuleæ.—A pretty herbaceous perennial, growing six inches high, with cordate coarsely-toothed leaves, and heads of blue flowers. Native of the Tyrol. Introduced in 1752. Flowers in July. It is the *Rapunculus comosus* (Miller). *Culture*.—Hardy ; common dryish soil ; propagated by division.

PHYTEUMA HUMILE, *Schleicher* (humble Rampion).—Campanulaceæ & Campanuleæ.—A very pretty herbaceous perennial, growing three inches high, with crowded lance-shaped leaves, and heads of blue flowers. Native of central and southern Europe. Introduced

in 1825. Flowers in July. Also called *Phyteuma armeriaefolium* (Tausch) ; and *P. graminifolium* (Sieber). *Culture*.—Hardy ; common dryish soil ; propagated by division.

PHYTEUMA ORBICULARE, *Linnaeus* (round-headed Rampion).—Polemoniaceæ.—A handsome herbaceous perennial, growing a foot high, with notched ovate heart-shaped leaves, and heads of blue flowers. Native of England, and central Europe. Flowers in June. Also called *Phyteuma capituliforme* (Rock) ; *P. comosum* (Gouan) ; *P. hemisphericum* (Generich) ; and *Rapunculus orbicularis* (Miller). *Culture*.—Hardy ; common dryish soil ; propagated by division.

PINGUICULA ALPINA, *Linnaeus* (alpine Butterwort).—Lentibulariaceæ.—A pretty little herbaceous perennial, growing three inches high, with a tuft of broadly ovate root-leaves, the edges of which are turned in, and solitary white flowers at the top of the slender stem. Native of Europe. Introduced in 1794. Flowers in April. Also called *Pinguicula alba* (Floerke) ; *P. alpestris* (Persoon) ; *P. flavescens* (Floerke) ; and *P. purpurea* (Willdenow). *Culture*.—Hardy ; moist peaty soil, and shady situation ; propagated slowly by division.

PINGUICULA GRANDIFLORA, *Lamarch* (great-flowered Butterwort).—Lentibulariaceæ.—A pretty little herbaceous perennial, growing three inches high, with a tuft of radical, broad, ovate, blunt leaves, and solitary deep blue flowers. Native of Britain, and of southern Europe. Flowers in April. Known also as *Pinguicula leptoceras* (Reichenbach) ; and *P. vulgaris* (Berges). *Culture*.—Hardy ; moist peaty soil, and shady situation ; propagated slowly by division.

POLEMONIUM PULCHERRIMUM, *Hooker* (prettiest Greek Valerian).—Polemoniaceæ.—A very handsome herbaceous perennial, growing six inches high, with pinnate leaves, having ovate leaflets, and corymbs of pale blue flowers. Native of North America. Introduced in 1827. Flowers in July. *Culture*.—hardy ; common soil ; propagated by division.

POLEMONIUM REPTANS, *Linnaeus* (creeping Greek Valerian).—Polemoniaceæ.—A very pretty herbaceous perennial, growing six inches high, with pinnate leaves, having ovate leaflets, and corymbs of nodding blue flowers. Native of North America. Introduced in 1758. Flowers in April. *Culture*.—Hardy ; common soil ; propagated by division.

POLYGALA CHAMÆBUXUS, *Linnaeus* (box-leaved Milkwort).—Polygalaceæ.—A neat tufted evergreen shrub, growing six inches high, with oblong lance-shaped leaves, and short spikes of yellow and purple flowers. Native of Europe. Introduced in 1658.

Flowers in May. *Culture*.—Hardy; peat and loam; propagated by division.

POLYGONUM VIVIPARUM, *Linnaeus* (alpine Bistort).—Polygonaceæ § Polygonææ.—A neat herbaceous perennial, growing six inches high, with lance-shaped revolute leaves, and white flowers intermixed on the spikes with bulbs. Native of Britain, and of Europe, Asia, and North America. Flowers in May. *Culture*.—Hardy; light moist soil; propagated by division.

POTENTILLA ALBA, *Linnaeus* (white-flowered Cinquefoil).—Rosaceæ § Potentillidæ.—A very pretty herbaceous perennial, of prostrate habit, with leaves formed of three to five leaflets, and corymbs of white flowers. Native of Wales and of Europe. Flowers in March. Also called *Potentilla Chusiana* (Genersich); *P. cordata* (Schränk); *P. nitida* (Scopoli); and *Fragaria alba* (Crantz). *Culture*.—Hardy; common soil; propagated by division.

POTENTILLA AUREA, *Linnaeus* (golden Cinquefoil).—Rosaceæ § Potentillidæ.—A pretty herbaceous perennial growing six inches high, with leaves of five-toothed leaflets, and large yellow flowers. Native of Scotland, and the Alps of Europe. Flowers in May. Also called *Potentilla Halleri* (Seringe); *P. maculata* (Gilbert); and *Fragaria aurea* (Crantz). *Culture*.—Hardy; common soil; propagated by division.

POTENTILLA CROCEA, *Haller* (Alp Cinquefoil).—Rosaceæ § Potentillidæ.—A pretty herbaceous perennial, growing six inches high, with leaves cut into several deep segments, and flowers on long stalks, of a deep yellow colour. Native of Britain and of the Alps of Europe. Flowers in July. It is also called *Potentilla alpestris* (Haller); *P. affinis* (Host); *P. dubia* (Suter); *P. pyrenaica* (Ramond); *P. salisburgensis* (Hænke); *P. filiformis* (Villars); and *P. verna* (Wahlenberg). *Culture*.—Hardy; common soil; propagated by division.

PRIMULA AURICULA, *Linnaeus* (Auricula).—Primulaceæ § Primulidæ.—A pretty dwarf evergreen herbaceous perennial, with obovate fleshy leaves, and umbels of yellow blossoms. Native of the Alps of Europe. Introduced in 1596. Flowers in April. Also called *Primula hutea* (Lamarck); and *Auricula ursi* (Adanson). *Culture*.—Best protected by a frame; light turfy loam; propagated by division.

PRIMULA CORTUSOIDES, *Linnaeus* (cortusa-leaved Primrose).—Primulaceæ § Primulidæ.—A pretty herbaceous perennial, growing six inches high, with cordate toothed leaves, and umbels of rosy-coloured flowers. Native of Siberia and Japan. Introduced in 1794. Flowers in May. Also called *Androsace*

primuloides (Möench). *Culture*.—Hardy; peat and loam; propagated by division.

PRIMULA FARINOSA, *Linnaeus* (mealy Primrose).—Primulaceæ § Primulidæ.—A very pretty herbaceous perennial, growing three or four inches high, with toothed wedge-shaped leaves, and pink flowers in umbels. Native of Britain and of Europe. Flowers in June. Also called *Androsace farinosa* (Sprengel). *Culture*.—Hardy; peat and loam; propagated by division.

PRIMULA DENTICULATA, *Smith* (Himalayan toothed Primrose).—Primulaceæ § Primulidæ.—A very pretty little herbaceous perennial, growing four inches high, with oblong toothed leaves, and heads of pretty lilac flowers. Native of the Himalayas. Introduced in 1838. Flowers in March. *Culture*.—Hardy; peat and loam; propagated by division.

PRIMULA NIVALIS, *Pallas* (snowy Primrose).—Primulaceæ § Primulidæ.—A very pretty herbaceous perennial, growing about four inches high, with obovate-toothed leaves, and umbels of white flowers. Native of Siberia. Introduced in 1790. Flowers in April. Also named *Primula algida* (Adams); *P. orientalis* (Willdenow); and *P. speciosa* (Gmelin). *Culture*.—Hardy; peat and loam; propagated by division.

PRIMULA PALINURI, *Petagna* (Palinuri's Primrose).—Primulaceæ § Primulidæ.—A neat herbaceous perennial, growing six inches high, with smooth spoon-shaped leaves, and umbels of yellow flowers. Native of Italy. Introduced in 1816. Flowers in April. *Culture*.—Hardy; peat and loam; propagated by division.

PRUNELLA GRANDIFLORA, *Linnaeus* (great-flowered Self-heal).—Lamiaceæ § Scutellareæ.—A very pretty herbaceous perennial, growing nine inches high, with ovate leaves, usually toothed, and purple labiate flowers growing in whorled spikes. Native of Europe and the Caucasus. Introduced in 1598. Flowers in July. It is, besides, named *Prunella speciosa* (Wenderoth); and *P. laciniata* (Leysser). *Culture*.—Hardy; common soil; propagated by division.

PRUNELLA HYSSOPIFOLIA, *Linnaeus* (hyssop-leaved Self-heal).—Lamiaceæ § Scutellareæ.—A pretty herbaceous perennial, growing nine inches high, with sessile lance-shaped leaves, and purple flowers, growing in whorled spikes. Native of Southern Europe. Introduced in 1731. Flowers in July. *Culture*.—Hardy; common soil; propagated by division.

PYRETHRUM ALPINUM, *Willdenow* (alpine Feverfew).—Asteraceæ § Tubulifloræ-Chrysanthemæ.—A showy herbaceous perennial, growing six inches high, with pinnatifid toothed leaves, and white flowers in solitary

heads. Native of the Alps of Europe. Introduced in 1759. Flowers in July. Also called *Pyrethrum saxatile* (Loddiges); *Chrysanthemum alpinum* (Linnaeus); *Leucanthemum alpinum* (Lamarck); and *Matricaria alpina* (Desrousseaux). *Culture*.—Hardy; common soil; propagated by division.

PYROLA ASARIFOLIA, *Michaux* (asarum-leaved Winter-green).—*Pyrolaceæ*. A neat and interesting evergreen herbaceous perennial, growing six inches high, with kidney-shaped crenated leaves, and racemes of whitish flowers. Native of North America. Introduced in 1810. Flowers in June. Also called *Pyrola chlorantha* (Nuttall). *Culture*.—Hardy; moist peaty soil, and shady situation; propagated by division.

PYROLA ROTUNDIFOLIA, *Linnaeus* (round-leaved Winter-green).—*Pyrolaceæ*.—A neat and interesting evergreen herbaceous perennial, growing six inches high, with roundish nearly entire leaves, and racemes of white flowers. Native of Britain and of Europe, and North America. Flowers in June. It is also known as *Pyrola americana* (Don); *P. declinata* (Möench); *P. grandiflora* (Raddi); and *P. major* (Lamarck). *Culture*.—Hardy; moist peaty soil, and shady situation; propagated by division.

RAMONDIA PYRENAICA, *Richard* (Pyrenean Ramondia).—*Gesneraceæ* § *Cyrtandrea*-*Didymocarpidæ*.—A beautiful little herbaceous perennial, growing three inches high, with a tuft of ovate hairy leaves, and large purple flowers, growing nearly solitary. Native of the Pyrenees. Introduced in 1731. Flowers in May and June. It is also called *Ramondia Myconi* (Reichenbach); *R. scapigera* (St. Hilaire); *Chaixia Myconi* (La Peyrouse); *Myconia boraginea* (La Peyrouse); *Myconia pyrenaica* (Autores); and *Verbascum Myconi* (Linnaeus). *Culture*.—Requires a dry frame; sandy peaty soil; propagated by division.

RANUNCULUS ALPESTRIS, *Linnaeus* (Alp Crowfoot).—*Ranunculaceæ* § *Ranunculeæ*.—A pretty herbaceous perennial, growing four inches high, with heart-shaped three-lobed leaves, and white flowers usually solitary. Native of Scotland and the Alps of central Europe. Flowers in August. Also named *Ranunculus crenatus* (Baumgarten); and *R. mugellensis* (Tenore). *Culture*.—Hardy; loamy soil; propagated by division.

RANUNCULUS RUTÆFOLIUS, *Linnaeus* (rue-leaved Crowfoot).—*Ranunculaceæ* § *Ranunculeæ*.—A pretty herbaceous perennial, attaining four inches high, with pinnate cut leaves, and handsome white flowers. Native of the Alps of Europe and Siberia. Introduced in 1759. Flowers in May. It is also called *Ranunculus Berardi* (Villars); *Callianthemum coriandrifolium* (Reichenbach); and

C. rutæfolium (C. A. Meyer). *Culture*.—Hardy; loamy soil; propagated by division.

RHEXIA MARIANA, *Linnaeus* (Maryland Rhexia).—*Melastomaceæ* § *Melastomeæ*-*Rhexiææ*.—A pretty herbaceous perennial, growing nine inches high, with lance-shaped three-nerved leaves, and corymbs of purple flowers. Native of North America. Introduced in 1759. Flowers in June. *Culture*.—Hardy; peat soil; propagated by division.

RHODODENDRON CHAMÆCISTUS, *Linnaeus* (ground-cistus Rose-bay).—*Ericaceæ* § *Rhododendreaæ*.—A beautiful little shrub, growing about six inches high, with elliptic sharp-pointed leaves, and terminal bunches of flesh-coloured flowers. Native of the Alps of Central Europe. Introduced in 1786. Flowers in May. Also called *Rhodothamnus Chamæcistus* (Reichenbach). *Culture*.—Hardy; but is best preserved in a cool frame, or under a hand-glass; peat soil; propagated by layers and cuttings.

RUBUS ARCTICUS, *Linnaeus* (Arctic Bramble).—*Rosaceæ* § *Potentillidæ*.—A curious and pretty herbaceous perennial, growing three or four inches high, with trifoliate serrated leaves, and solitary deep rose-coloured flowers. Native of Britain, and of Siberia and Canada. Flowers in June. *Culture*.—Hardy; moist peaty soil, and shady situation; propagated by division.

SAPONARIA OCYMOIDES, *Linnaeus* (basil-like Soap-wort).—*Caryophyllaceæ* § *Sileneæ*.—A beautiful trailing herbaceous perennial, with ovate lance-shaped leaves, and numerous pink blossoms. Native of southern Europe. Introduced in 1768. Flowers in May. It is also named *Saponaria repens* (Lamarck). *Culture*.—Requires a dry frame in winter; light sandy soil; propagated by cuttings.

SANTOLINA CHAMÆCYPARISSUS, *Linnaeus* (common Lavender-cotton).—*Asteraceæ* § *Tubulifloræ*-*Anthemidææ*.—A neat shrubby plant growing a foot high, with hoary toothed leaves, and yellow flowers in solitary heads. Native of southern Europe. Introduced in 1573. Flowers in July. It is the *Santolina cypressiformis* (Lamarck); *S. dentata* (Möench); and *S. incana* (Lamarck). *Culture*.—Hardy; light sandy loam; propagated by cuttings.

SATUREJA RUPESTRIS, *Wulfen* (rock Savory).—*Lamiaceæ* § *Satureææ*.—A neat shrub growing a foot high, with ovate blunt slightly downy leaves, and white flowers growing in dense spikes. Native of Carniolia. Introduced in 1798. Flowers in June. Also called *Satureja thymifolia* (Scopoli); *Calamintha ruspestris* (Host); and *C. thymifolia* (Reichenbach). *Culture*.—Hardy; dry sandy soil; propagated by division or cuttings.

SAXIFRAGA COTYLEDON, *Linnaeus* (Coty-

ledon Saxifrage).—Saxifragaceæ.—A beautiful tufted evergreen herbaceous perennial, growing a foot high, with flat oblong serrated leaves, and white flowers in large pyramidal panicles. Native of the Alps of Europe. Introduced in 1596. Flowers in June. It also bears the names of *Saxifraga multiflora* (Ehrhart); *S. pyramidalis* (La Peyrouse); *S. pyramidata* (Miller); and *Chondrosea pyramidalis* (Haworth). *Culture*.—Hardy; light dry sandy soil; propagated by division.

SAXIFRAGA GEUM, *Linnaeus* (Geum Saxifrage).—Saxifragaceæ.—A pretty tufted evergreen herbaceous perennial, growing nine inches high, with kidney-shaped toothed leaves, and panicles of pale red blossoms. Native of Ireland and of Siberia. Flowers in May. It is also called *Saxifraga dentata* (Link); and *Robertsonia dentata* (Haworth). *Culture*.—Hardy; light dry sandy soil; propagated by division.

SAXIFRAGA HIRCULUS, *Linnaeus* (Hirculus Saxifrage).—Saxifragaceæ.—A pretty tufted evergreen herbaceous perennial, six inches high, with lance-shaped blunt leaves, and solitary rich golden yellow flowers. Native of England, and of Europe, and America. Flowers in August. It is the *Hirculus hieracioides* (Haworth); and *H. propinquus* (Haworth). *Culture*.—Hardy; but duplicates should be kept in a cool moist frame; moist peaty soil; propagated by division.

SAXIFRAGA HYPNOIDES, *Linnaeus* (hypnum-like Saxifrage).—Saxifragaceæ.—A very pretty tufted evergreen herbaceous perennial, growing three or four inches high, with the leaves cut into linear divisions, and the flowers, three or four together, of a white colour. Native of Britain and of Europe. Flowers in April. There are several varieties which have received numerous names. *Culture*.—Hardy; light sandy soil; propagated by division.

SAXIFRAGA OPPOSITIFOLIA, *Linnaeus* (opposite-leaved Saxifrage).—Saxifragaceæ.—A very pretty tufted evergreen herbaceous perennial, growing one inch high, with tufts of ovate obtuse ciliated leaves, and numerous solitary large purple flowers. Native of Britain and of the Alps of Europe, and Siberia. Flowers in April. Also called *Saxifraga cœrulea* (Persoon); and *Antiphylla cœrulea* (Haworth). *Culture*.—Hardy; but a beautiful little plant for blooming in pots in early spring, for which it should be kept in a frame; sandy peat and loam; propagated by division.

SCABIOSA COLUMBARIA, *Linnaeus* (dove Scabious).—Dipsacaceæ.—A pretty herbaceous perennial, growing a foot high, with lyrate-pinnate leaves, and heads of violet flowers. Native of Britain and of Siberia.

Flowers in July. It is also called *Asterocephalus Columbaria* (Sprengel); *Columbaria rubella* (Presl); *Sclerostemma Columbaria* (Schott); and *Succisa Columbaria* (Moench). *Culture*.—Hardy; common soil; propagated by division.

SCHIVERECKIA PODOLICA, *Andrzejewsky* (Podolian Schivereckia).—Brassicaceæ § Pleurorhizæ-Alyssidæ.—A pretty little evergreen tufted herbaceous perennial, growing two inches high, with oval-oblong leaves, and close short racemes of white flowers. Native of Russia. Introduced in 1817. Flowers in May. Also called *Alyssum Besseri* (Steven); *A. podolicum* (Besser); and *Draba uralensis* (Willdenow). *Culture*.—Hardy; common dryish soil; propagated by division.

SCUTELLARIA ALPINA, *Linnaeus* (alpine Skull-cap).—Lamiaceæ § Scutellareæ.—A pretty prostrate herbaceous perennial, with hairy ovate serrate leaves, and large purple flowers growing in spikes. Native of the Alps of central Europe. Introduced in 1752. Flowers in June. Also called *Scutellaria compressa* (Hamilton); and *S. variegata* (Sprengel). *Culture*.—Hardy; common soil; propagated by division.

SCUTELLARIA GRANDIFLORA, *Sims* (great-flowered Skull-cap).—Lamiaceæ § Scutellareæ.—A very pretty herbaceous perennial, growing six inches high, with ovate roundish toothed leaves, and spikes of reddish flowers. Native of the Altaian Mountains. Introduced in 1804. Flowers in July. It is the *Scutellaria pulchella* (Bunge). *Culture*.—Hardy; common soil; propagated by cuttings.

SCUTELLARIA ORIENTALIS, *Linnaeus* (eastern Skull-cap).—Lamiaceæ § Scutellareæ.—A pretty herbaceous perennial, growing six inches high, with ovate deeply toothed hoary leaves, and oblong spikes of yellow flowers. Native of Asia Minor. Introduced in 1729. Flowers in July. Also called *Scutellaria caucasica* (Hamilton); and *S. Sieversii* (Bunge). *Culture*.—Hardy; common soil; propagated by division.

SEDUM DASYPHYLLUM, *Linnaeus* (thick-leaved Stonecrop).—Crassulaceæ § Crassuleæ.—A neat evergreen tufted herbaceous perennial, growing two inches high, with globose fleshy glaucous leaves, and small cymes of white flowers. Native of Britain and of Europe. Flowers in June. Also called *Sedum glaucum* (Lamarck). *Culture*.—Hardy; light sandy soil; propagated by division.

SEDUM RUPESTRE, *Linnaeus* (rock Stonecrop).—Crassulaceæ § Crassuleæ.—A neat evergreen herbaceous perennial, growing three inches high, with round fleshy awl-shaped glaucous leaves, and cymes of yellow flowers. Native of England and of Europe. Flowers in July. It is also called *Sedum minus* (Haworth); and

Sedum reflexum (De Candolle). *Culture*.—Hardy; light sandy soil; propagated by division.

SEDUM SEMPERVIVOIDES, *Fischer* (houseleek-like *Sedum*).—*Crassulaceæ* § *Crassuleæ*.—A neat evergreen tufted herbaceous perennial, growing six inches high, with ovate acute fleshy entire leaves, and corymbs of deep purple flowers. Native of Iberia. Introduced in 1823. Flowers in July. Also called *Sedum Sempervivum* (Ledebour). *Culture*.—Hardy; light sandy soil; propagated by division.

SEMPERVIVUM ARACHNOIDEUM, *Linnaeus* (cobwebbed Houseleek).—*Crassulaceæ* § *Crassuleæ*.—A curious evergreen tufted herbaceous perennial, growing six inches high, with fleshy leaves cobwebbed together, and cymes of purple flowers. Native of the Alps of southern Europe. Introduced in 1699. Flowers in June. *Culture*.—Hardy; light sandy soil; propagated by division.

SEMPERVIVUM GLOBIFERUM, *Linnaeus* (hen-and-chicken Houseleek).—*Crassulaceæ* § *Crassuleæ*.—A curious evergreen tufted herbaceous perennial, growing six inches high, with crowded fringed leaves, and yellowish flowers in cymes. Native of southern Europe. Introduced in 1731. Flowers in June. Called also *Sempervivum grandiflorum* (Haworth); and *S. soboliferum* (Bot. Mag.). *Culture*.—Hardy; light sandy soil; propagated by division.

SIBBALDIA PROCUMBENS, *Linnaeus* (procumbent Sibbaldia).—*Rosaceæ* § *Potentillidæ*.—A neat evergreen herbaceous perennial, growing three inches high, with trifoliate toothed leaves, and corymbs of yellow flowers. Native of Scotland, of Europe, Asia, and America. Flowers in July. It is also called *Potentilla procumbens* (Clairville). *Culture*.—Hardy; sandy loam and peat; propagated by division.

SIEVERSIA MONTANA, *Sprengel* (mountain Sieversia).—*Rosaceæ* § *Potentillidæ*.—A pretty herbaceous perennial, growing six inches high, with pinnatifid blunt leaves, and large yellow solitary blossoms. Native of the Alps. Introduced in 1597. Flowers in May. Also called *Geum montanum* (Linnaeus); *Bernoullia montana* (Necker); *Caryophyllata montana* (Scopoli). *Culture*.—Hardy; light loamy soil; propagated by division.

SILENE ACAULIS, *Linnaeus* (moss Campion).—*Caryophyllaceæ* § *Sileneæ*.—A very pretty evergreen tufted herbaceous perennial, growing two inches high, with narrow lance-shaped leaves, and small numerous rose-coloured flowers. Native of Britain, and of the Alps of Europe. Flowers in June. It is also the *Cucubalus acaulis* (Gunn); *C. muscosus* (Lamarck); and *Lychnis acaulis* (Scopoli). *Cul-*

ture.—Hardy; light dry sandy soil; propagated by division or by seeds.

SILENE ALPESTRIS, *Jacquin* (Alp Catchfly).—*Caryophyllaceæ* § *Sileneæ*.—A pretty herbaceous perennial, growing six inches high, with lance-shaped bluish leaves, and large panicles of white flowers. Native of Austria and Hungary. Introduced in 1774. Flowers in May. It is also known as *Silene viscida* (Sprengel); *Lychnis alpestris* (Linnaeus); and *L. quadrifida* (Scopoli). *Culture*.—Hardy; light dry sandy soil; propagated by division or by seeds.

SILENE PUSILLA, *Waldstein and Kitaibel* (dwarf Catchfly).—*Caryophyllaceæ* § *Sileneæ*.—A pretty herbaceous perennial, growing four inches high, with broad linear leaves, and pink flowers on long stalks. Native of Hungary. Introduced in 1804. Flowers in June. Also known as *Lychnis pusilla* (Link). *Culture*.—Hardy; light dry sandy soil; propagated by division or by seeds.

SILENE SAXIFRAGA, *Linnaeus* (Saxifrage Catchfly).—*Caryophyllaceæ* § *Sileneæ*.—A pretty herbaceous perennial, growing three inches high, with sharp linear tufted leaves, and pale pink flowers on long stalks. Native of the Alps of Europe. Introduced in 1640. Flowers in June. Also called *Cucubalus Saxifragus* (Lamarck); and *Lychnis saxifraga* (Scopoli). *Culture*.—Hardy; light dry sandy soil; propagated by division or by seeds.

SILENE SCHAFTA, *Gmelin* (the Schafta).—*Caryophyllaceæ* § *Sileneæ*.—A very handsome trailing evergreen herbaceous perennial, growing about four inches high, with obovate sharp leaves, and terminal spikes of pink flowers. Native of Siberia. Introduced in 1845. Flowers in July and August. *Culture*.—Hardy; light dry sandy soil; propagated by cuttings, division, or by seeds.

SOLDANELLA ALPINA, *Linnaeus* (alpine Soldanella).—*Primulaceæ* § *Primulidæ*.—A very pretty evergreen tufted herbaceous perennial, growing two inches high, with kidney-shaped leaves, and cone-shaped fringed blue flowers. Native of the Alps of Europe. Introduced in 1656. Flowers in April. It is the *Soldanella Clusii* (Schmidt). *Culture*.—Hardy, but like other minute plants should have the winter protection of a frame; peat and sandy loam; propagated by division.

SOLDANELLA MONTANA, *Willdenow* (mountain Soldanella).—*Primulaceæ* § *Primulidæ*.—A very pretty evergreen tufted herbaceous perennial, growing two inches high, with roundish heart-shaped leaves, and cone-shaped blue fringed flowers. Native of Austria. Introduced in 1816. Flowers in April. Also called, *Soldanella affinis* (J. Cree); and *S. alpina* (Schmidt). *Culture*.—Hardy, but like

other minute plants, should have the shelter of a frame in winter; peat and sandy loam; propagated by division.

STACHYS CORSICA, *Persoon* (Corsican Hedge-nettle).—Lamiaceæ § Stacheæ-Lamidaæ.—A very pretty little tufted-growing procumbent pilose herbaceous perennial, with ovate blunt crenate leaves, and whorls of large pink flowers. Native of Corsica. Introduced in 1823. Flowers in July. It is the *Glechoma grandiflora* (De Candolle). *Culture*.—Best sheltered in a dry frame in winter; light loam and peat; propagated by division.

STACHYS LAVANDULÆFOLIA, *Vahl* (lavender-leaved Hedge-nettle).—Lamiaceæ § Stacheæ-Lamidaæ.—A pretty procumbent sub-shrub, with oblong lance-shaped entire leaves, and whorled spikes of purple flowers. Native of Caucasus. Introduced in 1820. Flowers in July. It is the *Sideritis calycantha* (Bieberstein); *Zietenia lavandulæfolia* (Link); and *Z. orientalis* (Gleditsch). *Culture*.—Hardy; light loamy soil; propagated by division.

STATICE MINUTA, *Linnaeus* (small Sea-lavender).—Plumbaginaceæ § Staticeæ.—A pretty little evergreen herbaceous perennial, growing three inches high, with clustered wedge-shaped leaves, and few red flowers. Native of the Levant. Introduced in 1658. Flowers in June. *Culture*.—Hardy; sandy loam and peat; propagated by division.

STATICE RETICULATA, *Linnaeus* (matted Sea-lavender).—Plumbaginaceæ § Staticeæ.—A pretty evergreen herbaceous perennial, growing six inches high, with blunt lance-shaped leaves, and panicles of blue flowers. Native of Britain and of southern Europe. Flowers in July. It also bears the names of *Statice divaricata* (Cavanilles); *S. oleæfolia* (Host); and *Limonium reticulatum* (Miller). *Culture*.—Hardy; sandy loam; propagated by division.

STATICE SINUATA, *Linnaeus* (waved-leaved Sea-lavender).—Plumbaginaceæ § Staticeæ.—A very pretty herbaceous perennial, growing nine inches high, with lengthened lyrate leaves, and heads of pale yellow flowers within an enduring purple calyx. Native of Italy, Greece, Asia Minor, and the north of Africa. Introduced in 1629. Flowers in July. It is the *Limonium sinuatum* (Miller). *Culture*.—Hardy; sandy loam; propagated by division or by seeds.

TEUCRIUM PUMILUM, *Linnaeus* (dwarf Germander).—Lamiaceæ § Ajugeæ.—A neat procumbent shrub, with narrow linear entire leaves, and heads of purplish labiate flowers. Native of Spain. Introduced in 1816. Flowers in July. *Culture*.—Best preserved in frames in winter; common soil; propagated by cuttings.

TEUCRIUM PYRENAICUM, *Linnaeus* (Pyrenean Germander).—Lamiaceæ § Ajugeæ.—A pretty herbaceous perennial, of procumbent habit, with roundish crenate hairy leaves, and purplish flowers growing in heads. Native of Southern Europe. Introduced in 1731. Flowers in June. It is called *Teucrium reptans* (Pourret); and *Polium pyrenaicum* (Miller). *Culture*.—Best kept in frames in winter; common soil, propagated by division.

THALICTRUM ALPINUM, *Linnaeus* (alpine Meadow-rue).—Ranunculaceæ § Anemoneæ.—A pretty herbaceous perennial, growing six inches high, with elegant twice ternate shining leaves, and racemes of yellowish nodding flowers. Native of Britain, and of Europe, Siberia, and North America. Flowers in May. It is also the *Thalictrum alpestre* (Gaudichaud); and *T. saxatile* (Villars). *Culture*.—Hardy; common soil; propagated by division.

THYMBRA SPICATA, *Linnaeus* (spike-flowered Thymra).—Lamiaceæ § Melisseæ.—A pretty little shrubby plant, growing about nine inches high, with sharp linear ciliated leaves, and whorled spikes of purple flowers. Native of Candia. Introduced in 1699. Flowers in June. *Culture*.—Should be protected in a dry frame in winter; dry sandy soil; propagated by cuttings.

THYMUS CEPHALOTES, *Linnaeus* (beaded Thyme).—Lamiaceæ § Satureæ-Origanidæ.—A pretty little tufted shrub, growing six inches high, with sessile linear leaves growing in bundles, and heads of downy purplish flowers. Native of Spain and Portugal. Introduced in 1759. Flowers in June. Also called *Thymus villosus* (Willdenow). *Culture*.—Best preserved in a dry frame in winter; dry sandy soil; propagated by division or by cuttings.

THYMUS HIRSUTUS, *Bieberstein* (hairy Thyme).—Lamiaceæ § Satureæ-Origanidæ.—A pretty prostrate shrub, downy in every part, with sessile linear hoary leaves, and heads of purple flowers. Native of Greece and the Caucasus. Introduced in 1821. Flowers in July. It is the *Thymus incanus* (Willdenow). *Culture*.—Hardy; light dry sandy soil; propagated by cuttings or division.

TIARELLA CORDIFOLIA, *Linnaeus* (heart-leaved Tiarella).—Saxifragaceæ.—A very neat and pretty herbaceous perennial, growing six inches high, with heart-shaped acute lobed leaves, and spikes of whitish flowers. Native of North America and of Asia. Introduced in 1731. Flowers in April. *Culture*.—Hardy; loam and peat; propagated by division.

TRIFOLIUM ALPINUM, *Linnaeus* (alpine Trefoil).—Fabaceæ § Papilionaceæ-Trifoliæ.—A pretty little herbaceous perennial, growing

six inches high, with leaves of three linear leaflets, and heads of purple flowers. Native of Europe. Introduced in 1775. Flowers in June. *Culture*.—Hardy; light dry loamy soil; propagated by division.

TRIFOLIUM FIMBRIATUM, *Lindley* (fringed Trefoil).—*Fabaceæ* § *Papilionaceæ*—*Trifoliæ*.—A pretty trailing herbaceous perennial, with leaves of three oval toothed leaflets, and dense heads of purple flowers. Native of California. Introduced in 1825. Flowers in September. Also called, *Trifolium heterodon* (Torrey and Gray); and *T. Wormskoldii* (Lehmann). *Culture*.—Hardy; light dry loamy soil; propagated by division.

UMBILICUS PENDULINUS, *De Candolle* (common Navel-wort).—*Crassulaceæ* § *Crassulæ*.—A curious and pretty herbaceous perennial, growing six inches high, with roundish concave peltate leaves, and panicles of yellow flowers. Native of Britain, and of western and southern Europe. Flowers in June. Also known as *Cotyledon rupestris* (Salisbury); and *C. umbilicata* (Lamarck). *Culture*.—Hardy; light sandy loam; propagated by offsets.

VALERIANA SAXATILIS, *Villars* (rock Valerian).—*Valerianaceæ*.—A pretty herbaceous perennial, growing six inches high, with elliptic ciliated leaves, and corymbs of white flowers. Native of the Alps of Europe. Introduced in 1740. Flowers in July. Also known as *Valeriana celtica* (Linnaeus). *Culture*.—Hardy; common soil; propagated by division.

VERONICA CAUCASICA, *Bieberstein* (Caucasian Speedwell).—*Scrophulariaceæ* § *Rhinanthideæ*—*Veroniceæ*.—A pretty herbaceous perennial, growing six inches high, with leaves cut into linear segments, and racemes of flesh-coloured flowers. Native of the Caucasus. Introduced in 1816. Flowers in June. It is the *Veronica ossetica* (Steven). *Culture*.—Hardy; common soil; propagated by division.

VERONICA MONTANA, *Linnaeus* (mountain Speedwell).—*Scrophulariaceæ* § *Rhinanthideæ*—*Veroniceæ*.—A handsome herbaceous perennial, growing six or eight inches high, with ovate blunt notched leaves, and spikes of blue flowers. Native of Britain and of central Europe. Flowers in July. It is also called *Veronica subbiscutata* (Crantz). *Culture*.—Hardy; common soil; propagated by division.

VERONICA ORIENTALIS, *Aiton* (oriental Speedwell).—*Scrophulariaceæ* § *Rhinanthideæ*—*Veroniceæ*.—A pretty procumbent herbaceous perennial, with linear lance-shaped pinnatifid leaves, and long racemes of blue flowers. Native of Tauria and the Caucasus. Introduced in 1748. Flowers in June. It is the *Veronica heterophylla* (Salisbury). *Cul-*

ture.—Hardy; common soil; propagated by division.

VERONICA SAXATILIS, *Linnaeus* (rock Speedwell).—*Scrophulariaceæ* § *Rhinanthideæ*—*Veroniceæ*.—A pretty little herbaceous perennial, growing three inches high, with obovate notched leaves, and terminal corymbs of blue flowers. Native of Scotland, and of the European Alps. Flowers in July. *Culture*.—Hardy; common soil; propagated by division.

VESICARIA CRETICA, *Poirret* (Cretan Vesicaria).—*Brassicaceæ* § *Pleurorhizæ*—*Alyssideæ*.—A pretty herbaceous perennial, growing nine inches high, with oblong entire downy leaves, and racemes of yellow flowers. Native of Crete. Introduced in 1739. Flowers in May. It is also called *Alyssoides tomentosa* (Mönch). *Culture*.—Should be protected in a frame in winter; common soil; propagated by cuttings or seeds.

VINCA MINOR, *Linnaeus* (lesser Periwinkle).—*Apocynaceæ* § *Plumierææ*.—A handsome procumbent evergreen herbaceous perennial, with lanceolate elliptic leaves, and pretty blue flowers. Native of Britain and of Europe. Flowers in May and June. Also called *Pervinca minor* (Scopoli). *Culture*.—Hardy; common soil; propagated by division.

VINCA MAJOR, *Linnaeus* (greater Periwinkle).—*Apocynaceæ* § *Plumierææ*.—A handsome evergreen sub-shrub, growing a foot high, with ovate acute leaves, and large purplish-blue flowers. Native of Britain and of Europe. Flowers in April and May. It is the *Pervinca major* (Scopoli). *Culture*.—Hardy; common soil; propagated by division.

VIOLA BIFLORA, *Linnaeus* (two-flowered Violet).—*Violaceæ* § *Violeæ*.—A pretty herbaceous perennial, growing three inches high, with kidney-shaped notched leaves, and yellow flowers growing in pairs. Native of Europe, Siberia, and North America. Introduced in 1752. Flowers in April. Also called *Chrysion biflorum* (Spach). *Culture*.—Hardy; loam and peat; propagated by cuttings or division.

VIOLA BLANDA, *Willdenow* (pretty Violet).—*Violaceæ* § *Violeæ*.—A handsome herbaceous perennial, growing three inches high, with kidney-shaped leaves, and solitary white-scented flowers. Native of North America. Introduced in 1802. Flowers in May. It is called also *Viola amæna* (Le Conte); *V. clandestina* (Pursh); *V. Lecontiana* (Don); *V. obliqua* (Pursh); and *V. pallens* (Forster). *Culture*.—Hardy; loam and peat; propagated by cuttings or division.

VIOLA CALCARATA, *Linnaeus* (spurred Violet).—*Violaceæ* § *Violeæ*.—A pretty herbaceous perennial, growing six inches high, with ovate leaves, and large light blue flowers

growing on long stalks. Native of the Alps of Europe. Introduced in 1752. Flowers in April. It is also called *Viola alpina* (Tenore); *V. decumbens* (Möench); *V. gracilis* (Bivona Bernardi); *V. heterophylla* (Bertoloni); *V. Zoysii* (Wulfen); and *Mnemon calcaratum* (Spach). *Culture*.—Hardy; peat and loam; propagated by division or by cuttings.

VIOLA PEDATA, *Linnaeus* (pedate-leaved Violet).—*Violaceæ* § *Violeæ*.—A pretty herbaceous perennial, growing six inches high, with leaves cut into narrow lobes, and solitary large blue flowers. Native of North America. Introduced in 1759. Flowers in May. Also called *Viola digitata* (Pursh); and *V. multifida* (Miller). *Culture*.—Hardy; loam and peat; propagated by division or by cuttings.

VIOLA SEPTEMLOBA, *Le Conte* (seven-lobed-leaved Violet).—*Violaceæ* § *Violeæ*.—A pretty herbaceous perennial, growing six inches high, with cordate lobed leaves, and large blue flowers. Native of North America. Introduced in 1830. Flowers in May. *Culture*.—Hardy; loam and peat; propagated by division or by cuttings.

WAHLENBERGIA GRAMINIFOLIA, *De Candolle* (grass-leaved Wahlenbergia).—*Campanulaceæ* § *Lightfootæ*.—A handsome little tufted herbaceous perennial, growing six inches high, with alternate narrow crowded leaves, and heads of blue flowers. Native of Italy. Introduced in 1816. Flowers in May. It is the *Campanula graminifolia* (Linnaeus); and *Edraianthus graminifolius* (De Candolle). *Culture*.—Requires the shelter of a frame in winter; loam and peat; propagated by division.

WALDSTEINIA GEOIDES, *Willdenow* (geum-like Waldsteinia).—*Rosaceæ* § *Potentillidæ*.—A neat herbaceous perennial, growing six inches high, with five-lobed toothed leaves, and corymbs of small yellow flowers. Native of Hungary. Introduced in 1804. Flowers in June. *Culture*.—Hardy; common soil; propagated by division.

ZIZIPHORA CLINOPODIOIDES, *Lamarck* (clinopodium-like Ziziphora).—*Lamiaceæ* § *Monardeæ-Rosmarinidæ*.—A pretty subshrub, growing nine inches high, with narrow lance-shaped leaves, and heads of purplish flowers. Native of Armenia and Siberia. Introduced in 1803. Flowers in July. It is also named *Ziziphora capitata* (Falk); *Z. Cunila* (Desfontaines); *Cunila capitata* (Linnaeus); *Thymus lucidus* (Ehrhart); and *T. punctatus* (Willdenow). *Culture*.—Hardy, but best kept in a frame in winter; light sandy soil; propagated by seeds or cuttings.

ZIZIPHORA DASYANTHA, *Bieberstein* (thick-flowered Ziziphora).—*Lamiaceæ* § *Monardeæ*

Rosmarinidæ.—A pretty procumbent subshrub, with ovate or oblong leaves, and heads of purplish flowers. Native of the Caucasus. Introduced in 1803. Flowers in June. It is the *Ziziphora Puschkini* (Adam). *Culture*.—Hardy, but best kept in a frame in winter; light sandy soil; propagated by seeds or cuttings.



BRITISH WILD FLOWERS.

THE PYROLA, OR WINTER-GREEN.

THE scientific name of this pretty little family of plants, is suggested by a certain degree of resemblance between the leaves of some of the species, and those of the *Pyrus*, or pear-tree. The English title of winter-green obviously refers to the evergreen character of the plant. The species are among the more interesting of our wild flowers, not indeed remarkable for any showy properties, nor of very particular microscopical interest, but invested with the charm of rarity, and having much neatness both of form and habit, and a pleasant fragrance in the blossoms.

In general terms, the species may be said to consist of perennial herbs, with a short stem, bearing a few simple evergreen leaves, and terminating in an erect raceme of little bell-like flowers. The flowers are, however, not such as are properly called bell-shaped, being formed of five petals, only slightly united at the base, instead of being in an

entire piece throughout. The general habit will be understood from the engraving. Technically, the genus is defined thus :—*Calyx*, five-cleft; *corolla*, of five petals, slightly united at the base; *stamens*, ten, inverted, with two cells, each opening by a round pore at the base; *style*, five-lobed; *capsule*, five-celled, five-valved, opening at the angles at the base; *seeds*, numerous, with a loose testa, or covering. This genus and an allied plant form together, according to the views of some botanists, the British representatives of the tribe Pyroleæ, of the natural order Ericaceæ. Other authorities, who restrict the order Ericaceæ within narrower limits, regard the Pyroleæ as forming a separate though allied group; the differences between these views being, however, practically unimportant, inasmuch as they do not disturb the group itself. The British species are four in number, as given below :—

Pyrola rotundifolia, Linnæus (round-leaved Winter-green).—This species has creeping underground scaly stems, which rise from six to twelve inches above the surface, and in the lower part are furnished with a few obovate or orbicular leaves, with the margins more or less distinctly crenelled; they are smooth, dark green, and shining above and paler beneath, and are attached by a footstalk two or three inches long. The stems terminate in an erect elongated raceme of numerous white drooping flowers, formed of five oblong-ovate petals, and seated on a calyx of five lance-shaped acutish persistent segments. The flowering season is from July to September; and the plant is met with, though rarely, in dry heathy woods, moist shady situations, and in reedy marshes.

Pyrola media, Swartz (intermediate Winter-green).—The general appearance of this is like that of the former species, it having creeping underground stems, rising from six inches to a foot high, and furnished near the base with a few leaves, which in this case are of an ovate or obovate figure, the margins being distinctly crenelled, the upper surface deep green and shining, and the lower surface paler. The flowers, which grow in an erect terminal raceme, are formed of five roundish ovate petals, and are less expanded than in the preceding; they are white, but have a pinkish tinge, and the calyx segments are acutely ovate. This flowers in July and August, and is also found in woods and shady places, especially in the north.

Pyrola minor, Linnæus (lesser Winter-green). This is altogether smaller than either of the two preceding species, but possesses the same general habit. The leaves are ovate-roundish, more or less deeply crenelled on the margins, dark green above, and shining, and

below of a pale dull green. The stem grows from four to eight inches high, terminating in a raceme of numerous drooping flowers, which are formed of five roundish ovate concave petals, of a white or pinkish colour, and having the calyx segments ovate-triangular. The flowers in this are more nearly closed than in the last. The flowering season is in July. It is less rare than the two former, and is found in mossy woods and thickets, most frequent in Scotland.

Pyrola secunda, Linnæus (second-flowered Winter-green).—This is a small-growing and distinct species, with long, slender, underground stems, growing up about six inches high, somewhat trailing at the base, and often branched. The leaves are somewhat clustered about the lower part of the stem, and are ovate with an acute point, the margins finely and sharply serrated; they are green and smooth above, and paler beneath, attached by footstalks about an inch long. The flowers form a terminal raceme, and are second, that is, all directed one way; they are small, formed of five ovate concave petals, of a white or greenish colour, nearly closed, and with the style much projecting; the calyx is formed of five ovate-obtuse spreading teeth. It flowers in July; and is a rare plant, found chiefly in mossy Alpine woods.

The species of *Pyrola* are possessed of astringent and vulnerary properties, but are not at present applied to any particular use.

The cultivation of these plants is rather difficult unless a suitable situation can be provided for them; in other words, they are less accommodating in respect to the situation they occupy, than are the majority of plants. The best of all situations for them, is a moist, cool, shady peat border, and when this cannot be given them, the nearer it is approached, the better. Miller says, they are "very difficult to cultivate in gardens, for as they grow on very cold hills, and in mossy moorish soil, when they are removed to a better soil and a warmer situation, they seldom continue long." This sufficiently indicates the treatment they ought to receive. The best time for removing them from their natural stations to the garden, is after they have done blooming, or from the end of August to the end of September; the situations where they grow under circumstances most favourable to removal—that is, as much exposed as possible—having been, if necessary, marked when they were in flower. They should be taken up with as much soil as possible attached to their roots, and in this state carefully replanted in the situations chosen for them, the essentials of which are coolness, shade, and moisture sufficient to maintain a constant dampness. The best soil to use is the light porous peat earth which

owes its spongy texture to the presence of decomposed sphagnum moss; or, in the absence of this, any light fibrous peat may be employed. The admixture of a moderate proportion of sand is desirable; this should be the pure silver sand, or that form of silver sand which is common on heathy wastes, and is naturally intermixed with a portion of the black soil, giving it a greyish colour. No manure should be applied to them, but in dry weather an abundant supply of water, sufficient to maintain the dampness of the soil.

Some plants should be grown in pots, in which, with a little care, they will readily prosper. Pots of six inches diameter, are of convenient size for them. These should be about a fourth part filled with broken potsherds, on which a layer of sphagnum should be added, and the remainder should be turfy soil in which to plant the roots. The surface may be covered over with fresh sphagnum, to keep them moist and cool. The pots should be set in pans, or feeders, which throughout the summer season are to be kept supplied constantly with water, in which the pots should stand. A northern aspect, where but little sun can reach them, will be most suitable for them. In winter the pots may be set out of the pans, in a cold frame, and require no especial attention till the return of warm weather to render necessary the application of water.

Propagation may be effected when required, by dividing the perennial underground stems carefully, after the flowering season is past, that is, early in September.

BEJARIA ÆSTUANS.

Bejaria æstuans, Mutis (glowing Bejaria).—Ericaceæ § Rhododendreæ.

There is among the group of plants allied to Rhododendrons much greater variety of character and appearance, than the species now cultivated in our gardens would alone seem to render probable. In the extensive genus Rhododendron, there is, for example, an uniformity of character which is sufficient to connect them even in the eye of a tyro. It is true that our gardens afford also Ledums and Kalmias, besides other plants differing from Rhododendrons; but in these cases the species are few, compared with the number of Rhododendrons familiar to all who take an interest in matters of this kind; and in consequence, they do not much affect the idea of sameness of habit and character which becomes associated with Rhododendrons. Botanists, however, are familiar with other allied plants besides those just named, affording material difference of outward aspect, and which are not known to the majority of culti-

vators. Among these will be found the species now under notice; which, besides novelty of character, bears also the additional recommendation of a gaudy and attractive appearance—at least, this is the fair presumption from the name it bears, which seems to have been suggested by the glowing aspect of the plant, from the rich colouring of its flowers.

The generic name *Bejaria* is spelled in two ways in botanical books, namely *Bejaria*, and *Befaria*. The first, however, is the most proper mode, inasmuch as the genus was dedicated by Mutis, in honour of his friend Professor Bejar of Cadiz. It should be spoken as if written *Beharia*. The species of *Bejaria*, little known in English gardens, inhabit the alpine districts of Peru and Mexico, where they rival in beauty the *Azaleas* and *Rhododendrons* of North America. The genus is nearly related to *Rhododendron*, differing chiefly in the petals of the flowers being distinct, that is not united into a tube, although they overlap each other, and thus give the flowers a tube-like appearance.

Bejaria æstuans, is one of the finest of its genus. It is a much branched shrubby plant, growing from ten to fifteen feet high, the branches being arranged in a sub-verticillate manner, and on the younger parts clothed with clammy glandular hairs. The leaves are elliptic, smooth on the upper surface, and downy and glaucous beneath, and fringed with blackish glandular hairs; while young they are clothed with rusty tomentum on the under side, but in the mature state they are there very glaucous, and dark green on the upper side. The flowers are borne in terminal simple corymbs; the corolla upwards of an inch in length, beyond which the pistil is considerably projected; this is purple, or, according to Mr. Lobb, rose-coloured; the calyx and flower stalks are covered with glandular hairs, and are rendered clammy by the viscid secretion of the glandular surface.

New Grenada, near Gonzanama, is the originally recorded native locality of this species. Mr. W. Lobb, by whom it has been forwarded to Messrs. Veitch, of Exeter, found it in the province of Chachapoyas, at an altitude of 8,000 feet.

The species will require to be treated as a greenhouse plant. Of its adaptability to the purposes of the cultivator, we are not aware that any experience has been yet acquired; but there seems no reason to fear, that it will refuse to develop its beauty under artificial cultivation. From its natural affinity to the Indian *Azaleas*, it may be submitted to a similar mode of treatment, with every probability of success. Thus, it should be planted in turfy peat soil, mixed with sand and char-

coal to secure in its mechanical texture the requisite porosity to render it permeable to water ; it should be potted after flowering, and wintered in a cool dry greenhouse ; it should be assisted at the time of its renewed growth by a slight increase of temperature, such as the coolest position in a forcing house would afford ; and this growth should be perfected and matured in the greenhouse, where it would be more freely exposed to the influence of the atmosphere. Like most of its congeners, it will probably not at any time bear drought (extreme) with impunity, though when in an inactive state, the opposite condition should be as cautiously avoided. Inarching is likely to prove the readiest means of propagation ; and as stocks for this purpose, we should propose that healthy well-rooted young plants of the common Pontic Rhododendron, or the common Indian Azalea, should be tried.

FORCING FLOWER PLANTS AND FRUITS.

It has been asserted, and to this day acted upon by many, that forcing so much weakens plants, that it requires a season or two to bring them round again. This strange notion tends to the evil it sets out upon, and causes what is, thereafter, considered proved by the result. Let us take a very favourite subject, more mismanaged in the forcing than many, and yet calculated to prove our case better than any other, because it is so easily tried by all classes.

THE ROSE.—Suppose we go to the flower markets for forced roses, we invariably find them very much drawn ; the shoots weakly, the stems unable to support the flowers : these have no sooner done flowering than they are almost worthless, and why ? Because they have been violently forced. They have been grown in the open ground until the very season they are required to be put out of their way ; they are necessarily forced violently, have to do four or five months' work in two months, and, consequently, cannot do it so well. They cannot in two months' driving grow so strong as when they have their natural time to do it in ; they are every way depreciated—but let us do the forcing as it should be done, and they will grow as strong and as full of bloom, and be as ready to be forced again seven years running, and improve every year, as if they were in their own open ground. The truth is, that roses want two, if not three seasons to prepare them. Select strong young plants, pot them in strong loam and dung, with good room for their roots ; plunge them in the open air until December ; now put them in a green-house, prune all the strong wood in to the lowest two eyes, cut out

close all the thin weakly shoots, and see that they have the genial warmth of the greenhouse, plenty of air when the weather is warm enough to do it safely, and water occasionally, and the shoots will soon push strong and well ; let any that come out weakly from different parts of the tree or bush be rubbed off, they are of no use, and only weaken those which are. Of course they will be much forwarder than those in the open air, and especially if the weather be cold ; as soon as the buds appear, remove them. The plant must not be weakened by blooming ; let there be abundance of water to sustain the growth, and as soon as May is pretty nearly out, plunge them to their rims in the open ground, taking great care that they do not suffer for want of water : when the growth is completed, and the leaves are fully developed, and their shoots at full length, let there be no more water given ; the wood will soon ripen, and the leaves will have fallen long before the plants that have been all through their growth in the open air. When the leaves have fallen, the plants may be looked upon as at rest ; they may be removed into the shade. In November the roots may be examined, that is to say, the balls turned out ; and if the roots are matted round the pot, they must be shifted to pots of a larger size, without disturbing the ball. All the strong branches may be again shortened to two eyes, all the weakly ones cut close again ; they may be placed in the greenhouse at once, which will be a month sooner than they were the previous year. They will soon start again ; they must be guarded from frost, or any near approach to it, as jealously as a tender plant ; they will show their buds much sooner this year than they did last, and you would find them, if allowed to go on to bloom, very respectably grown compared to forced roses generally,—but we take off the buds as soon as we can get hold of them, again to throw all their strength into the growth. They will this year be fully established, their growth will be strong, they may be plunged in the open air again at the end of May, and be carefully tended as to water, till their growth is complete, and the leaves are turning ; now comes another season of rest, far earlier than they rested last year. In due time, when the leaves are fallen, remove them to the shade again, to abide the period of being set to work ; again examine the balls, and if the roots are matted, change their pots to a larger size, keeping to strong loam and dung for their compost. They may be housed this time in October, pruned as before, and allowed to grow ; syringe them if there is any appearance of green fly, and if this does not clear them, fumigate them with tobacco-

smoke, and syringe them afterwards. They will make rapid advances—let the house be kept through the winter at forty-five degrees in the day, and forty at night; whenever air can be given, and the temperature kept to this, be it so, for they cannot have too much air. The trees or bushes will continue their growth, and go up to bloom, without drawing, or weakening at all; and when in flower they should be kept in a temperature not exceeding forty-five degrees. It will be found that these roses want no more support than out-of-door ones in their proper season; and, moreover, they will have now been brought into a regular early growth, which should be kept up: they will have made their growth months before those out of doors, consequently will begin their rest months before them, and the early seasons may be preserved as long as you please. The seasons, with all things, may thus be completely changed. So much for roses, but it is the same with—

RHODODENDRONS AND AZALEAS.—Serve them the same as roses; select them early, let them begin their growth earlier; destroy the bloom the first season or two, let them make their growth earlier, and set their bloom, and about the third season you will have done what you have done for the roses. Nobody can for a moment suppose that plants can be forced completely out of their season, by two months, without some violence; but if you take two or three seasons to prepare them for the change of climate, it is the same with these as with many other subjects.

VINES.—Who that expects to force grapes early will do all at once? But when vines are forced a little earlier each year, and you take several years to bring them forward, a little earlier each season, you can in time bring them to anything; therefore due regard should be had to doing everything by degrees. The first year, bring them a month earlier; the second year, bring them two months earlier; and so by degrees you may almost reverse the seasons of a house of vines, and keep them up to it as healthily and as regularly as the ordinary vine in ordinary seasons.

FRUIT TREES in pots are just the same; when you have, after repeated forcings, brought them to the season you want, they will come to it as regularly as you can wish, and all you have to do is to provide them proper pot-room, and no more. So far from being the worse for forcing, they are the better for it; they rarely miss making and ripening their wood, they seldom fail producing plenty of fruit-buds, and, when set to work at the proper time, seldom fail to produce their regular fruit in season.

PEACH AND NECTARINE HOUSES.—How would these things prosper if they were the

worse for forcing, when forcing is their annual lot? There never was a more mistaken notion; but the truth is, that the effect of doing a thing improperly is seen, and then it is assumed by the ignorant that a subject is the worse, without once thinking that the difference between doing a thing properly and improperly is all that can be spoken of.

FORCING IN GENERAL is improperly conducted; subjects are potted, they are selected with plenty of bloom-buds upon them; they are often moved from the cold garden or cold frame to the forcing-house, set to work quicker than is good for them, and driven twice as hard as they ought to be; their flowers come out enough to answer the temporary purpose of sale, or a short period of bloom for ornament, and the plants all but die under the effort; whereas, if they were gradually inured to it, brought by degrees to the transition, and season after season for the same purposes, they would be found as tractable as those bloomed in their proper season, and they would come year after year better instead of worse. Certain it is, that if plants are jumped out of beds into pots, and out of pits into warm houses, they have not a common chance of doing moderately well, and when they have done all they can they are too weak to recover their strength for some time; this is not the consequence of forcing, but the consequence of forcing improperly, and the sooner the silly notion and the bad management are got rid of, the better.

GARDENING MEMORANDA FOR JULY.*

THE popular and now very general operation of rose-budding is now going on. The briars are in good order, the bark lifts easily, and the greatest number of roses are blooming, to give us the opportunity of choosing from them the sorts we desire to propagate. As the weather is generally very dry this month, it is worth the trouble of tying over the bud, when connected and properly secured, a little bunch of damp moss; it prevents the burning rays of the sun from drying the bud and curling up the bark; and in really hot weather is of the greatest service to the operation. In the event of the sun being very hot, it is worth while the first few days to occasionally wet the moss. We have had a piece of roses so managed bud to a plant, while others not so treated have in too many instances failed; there is therefore no doubt of its efficacy. This month and next, those who wish for dwarf chrysanthemums should take off the tops of plants, and strike them

* A very elaborate and complete Calendar of Gardening Operations for July is published in No. 81 of the Horticultural Magazine.

with a little bottom heat; for the plants, having made a great part of their growth, will not grow much more after striking, that is, if properly managed. Stone-fruit trees may be budded as well as roses. The removal of all useless shoots from wall-fruit trees, and especially grape vines, and even gooseberry and currant bushes, where the fruit is being grown for exhibition, are operations of importance; by removing the little spreading shoots from gooseberries and currants, and thinning the fruit, they are to be grown much finer, and the wood they are allowed to make is much stronger, than when allowed to grow their own way. The planting, hoeing, earthing up, weeding, and watering, go on as usual in the kitchen garden. In the stove we have many fine exotics coming into bloom; they may be removed to the conservatory; but it must be always remembered, that when any very fine specimens of stove or orchideous plants in flower are removed to the conservatory, there must not be any draught allowed, by opening the house at both ends or bottom and top; and these stove plants should be placed in the warmest spot, and be shaded from the heat of the sun, or their beauty will be very transient. The greenhouse is getting bare, most of the subjects being turned out of doors. *Camellia Japonica* will have made its growth and settled its bloom for next year: they will require to be kept very cool, have plenty of air, little sun, and very little water, nevertheless they must not be distressed. Some of the subjects in the flower clumps and borders will have declined bloom, and require to be replaced with others; for this purpose, always be provided with plenty of cuttings of all appropriate plants: the scarlet geranium is one of the very best of this class; it can always be propagated, it is always in bloom, its brilliance is only surpassed by some of the scarlet verbenas. Many thin fruit trees to bring the remainder larger; it is on the whole a good plan, if size be an object. It applies especially to peaches, nectarines, apricots, cherries and plums. Dahlias are making rapid growth now, and unless constantly tied up to proper stakes, are sure to suffer from the wind, and often from their own weight alone. The destructive earwig ought to be by this time extirpated, for if neglected till now, all the vigilance in the world will hardly suffice to prevent their depredations; treat the blooming carnations and picotees like pinks; tie and tear down the calyx, and regulate the petals.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING JULY.

The Greenhouse.—From sixty to seventy degrees by day, and from fifty to sixty degrees by night.

The Conservatory.—From sixty to seventy degrees by day, and from fifty-five to sixty degrees at night.

The Plant-Stove.—From seventy to eighty-five degrees by day, and from sixty to seventy degrees at night.

The Orchid-House.—The warm or Indian house from eighty-five to ninety degrees by day, and seventy at night. The cool or Mexican house, seventy-five to eighty degrees by day, and from sixty to sixty-five degrees at night.

MAHONIA OR BERBERIS.

THIS is one of the prettiest evergreens in cultivation, at first known as the *Berberis*, but since by some called *Mahonia*. Seedling varieties are becoming plentiful in this country, and doubtless we shall have them much less like each other by-and-by than the species, as they are called, are at this time. The varieties or species most familiar just now are:—

Mahonia Aquifolium, known as *Berberis Aquifolium*.

Mahonia fascicularis, known as *Berberis pinnata* and *Mahonia diversifolia*.

Mahonia nervosa, known as *Berberis nervosa* and *Mahonia glumacea*.

Mahonia repens, known as *Berberis repens*.

We have seen a bed of seedlings exhibiting a greater variety of foliage than these four present. The soil the plant thrives best in is that adapted for American plants; but it may be stronger with the loam, for they will grow very well in one half turfy peat and one half sandy loam. The plant requires no other care after planting than enough to see that it does not flag for water in the heat of summer; and as branches are very apt to shoot off, and leave the rest of the plant stunted, care must be taken to stop any thing of this sort directly, by cutting the branch back, and, if necessary, off altogether. It is one of the best of the moderately dwarf plants, that are so useful in diversifying the front borders, for no plant will better bear the knife, if it be required to be cut in. Their yellow bloom is beautifully distributed over the plants at the end of every shoot; and in the spring the golden branches have a rich appearance. No plant is more easily propagated. Cuttings of ripened wood will strike freely under a handglass in a shady border, and the lower branches root very soon when layered. Indeed, it may often, if not generally, be torn off the parent plant, and will bring away enough root with it to live, if planted where it is to remain; but as the lower branches can be pegged down under the surface without spoiling the appearance—for they are always feathered to the ground—it is better always to do so, because they

form a better root, and feel their remove less. The seeds are ripened within purple berries, that look as pretty as the flowers; and when they are about to fall, they should be gathered, and saved in a dry place. The seeds may be washed out, and sown in large-mouthed pots, in the early spring, and kept in a cold frame or a greenhouse. When they are up and large enough to lay hold of, they may be planted out an inch apart, and be allowed to establish themselves and grow until they touch each other, or near about it, when they may be planted out in proper beds, which can be hooped over, to protect the growing plants through the winter, for in mild weather they do not cease growing. It is absolutely necessary, therefore, to keep the frost from the young growth; for however hardy the tree may be in a general way, the young branches may easily be cut off by cold winds or hard frost. In these beds they ought to be planted about six inches apart all over the surface, which is most convenient when four feet wide or thereabouts. In this bed they may stand two or three seasons; in fact, until they touch or nearly touch each other. From this bed they may be planted where they are to remain, or be transplanted into another bed a foot apart; but they will require no more protection, unless there are any very hard frosts indeed; for the plant is turned out into shrubberies as soon as it is large enough, and does not appear to be at all injured by the ordinary winters. The plants struck from cuttings may be planted out in just the same manner, and be treated in the same way until they touch each other, when it is quite time to move them into a similar bed, and double the distance from each other. The shrub sets off a border so well, and gives such an excellent diversity among the very few good things we have got as fit for the foreground in well laid out shrubberies, that we should be very much inclined to plant liberally of them, not less for their diversity of foliage than the different disposition of the flowers. The plants raised from layers will be, of course, larger than those from seed and those from cuttings, and require a greater distance accordingly. When these plants are to be put out where they are to remain, there must be as much as half peat mixed with the ordinary earth for a distance of a good two feet diameter, and a foot and a half deep, so that the hole may be dug nine inches, which may be called a spit deep, and the soil laid on one side. The next spit, if good, may be loosened up, and mixed with as much peat as will fill up the hole; but if the bottom spit be bad, throw it out and carry it away, and mix peat with the top spit, and fill the hole up for planting in the centre.

ALSTRÖMERIA.

THIS may be set down as one of the most showy of stove, greenhouse, and frame plants, and some are all but hardy. At one time it was brought into repute, by the offer of prizes for them at floral exhibitions, but from some cause or other they fell into disrepute, and we rarely see them now in collections. The principal species are:—

Acutifolia, red and yellow, flowering in September, nearly hardy climber.

Aurantiaca, orange, flowering in June, greenhouse.

Edulis, red, flowering in July, stove climber.

Flos Martini, white and purple, flowering in June, stove perennial.

Hæmantha, orange and red, flowering in July, stove perennial.

Hirtella, red and yellow, flowering in July, hardy climber.

Ligtu, scarlet, flowering in March, stove perennial, fragrant.

Neillii, pale rose, flowering in June, greenhouse perennial.

Oculata, rosy purple, flowering in June, greenhouse climber.

Ovata, red and yellow, flowering in June, hardy climber.

Pallida, pink red, flowering in June, greenhouse perennial.

Pauciflora, orange and green, flowering in September, stove climber.

Pelegrina, striped, flowering in July, greenhouse perennial.

Psittacina, crimson, flowering in September, frame perennial.

Pulchella, otherwise *Hookerii*, scarlet, flowering in June, stove perennial.

Pilosa, scarlet, flowering in October, stove perennial.

Rosea, pink, flowering in July, stove perennial.

Salsilla, green and crimson, flowering in June, stove climber.

Acutifolia aurea, yellow, flowering in September, frame climber.

Barclayana, orange, flowering in July, frame perennial.

Berteroana, pale pink, flowering in July, frame perennial.

Bicolor, flowering in September, stove perennial.

Chilensis, pink, flowering in July, frame perennial.

Errembaultii, white spotted, flowering in August, frame perennial.

Besides these, there are English seedlings: some of which are improvements on the sorts from which they were raised; but the subject has never been taken up in earnest by many

persons, so that little or no account has been taken of them. Many of the sorts are increased by their roots, which are parted; others from cuttings, which strike freely. They all thrive in the same compost: turfy peat, rich loam from rotten turfs, and sand, in equal proportions. The pots must be well drained with crocks one-third of the depth up, and as soon as the roots reach the side and begin to mat together, shifted, however only one size at a time. These plants, according to their respective stations in the greenhouse or stove, may be grown pretty fast until they occupy twelve-size pots, and when they are beginning to rise for bloom, they must be freely watered. If the flower is very abundant, liquid manure will be of service, as it will afford extra nourishment, (put as the plant most requires it,) and greatly increase the size of the flowers, as well as, in the opinion of some, render the colours more brilliant. They must have as much air as possible and all the sun, until the colours are showing, when they must be slightly shaded to prevent the petals burning. After the bloom is over, the plants may be turned out of the pots, and parted if increase is wanted, and if not, shifted to a larger size. When parted, the smallest piece with a bit of root to it will make a good plant. These portions should be potted in as small sized pots as they will go in, because room for wintering is an object, but as they fill with roots they must be changed to larger sizes; when the plants fairly fill up a twelve-sized pot, they form very noble objects, and show a mass of bloom very desirable in an exhibition or a conservatory. Many put out the small parted plants into the border in front of a hot-house, to grow there till late in the autumn, and only pot them just in time for their winter quarters. The seeds, whether imported or saved in England, have to be sown in the spring in wide-mouthed pots, thinly scattered, and when large enough may be pricked out half-a-dozen in a pot, so as to be an inch and a half apart. In these pots they may be grown till they touch one another, when they may be potted singly in small pots, and be treated like other plants.

THE GARDEN DAISY AND ITS CULTURE.

THIS is one of the simplest and prettiest of hardy spring flowers, and the great variety renders it interesting. It is rejected by many, not for its lack of beauty, but because it is so hardy, so prolific, and consequently so common, that no value is attached to it. The double varieties are the only ones cultivated in gardens. They may be classed among the very few subjects that form good edgings to

beds, borders, and clumps. They are constantly spreading or increasing by offsets, which root of themselves, and therefore separate with the greatest facility. They may be planted for edgings, four inches apart, and in one season they join by spreading. They grow in any kind of soil, and bloom freely in May and June. There are several very distinct varieties, red and white with stiff quilled petals, and others of the colour with flat but narrow petals, making a better formed flower. There are also monster kinds of flowers with small blossoms all round the large one; these are commonly called hen-and-chicken daisies. The roots should be parted, so that there shall be only one heart in any piece; those may be planted out in beds six inches apart, or on the edges which they are to form four inches apart, merely being dibbled in and the earth well closed about their roots; and here they may remain until they are too thick; these roots are generally quite large enough to part into half-a-dozen or more separate plants, by merely tearing the hearts asunder with their roots to them, and if any of them happen to come away without any root, it will soon strike new ones. In forming edgings, regard must be had to the colour and seasons; they ought not to be mixed, but when used for edgings to geometrical or uniform gardens, the different colours may be used to the different beds, taking care that the same colour is used uniformly to give a proper effect. Thus, if the beds be formed in series of six alike, not less than three should be of a colour, and those alternately; if they are in series of eight, they should be four alike, and they alternately; nothing is more offensive to the eye than an awkward and ununiform disposition of colours. If this neglected plant, however, were not so common, it would rank before a hundred less brilliant subjects and less permanent bloomers, for it possesses some advantage over many: its extreme hardiness, its indifference to where it is placed, in what it is grown, and the length of time it continues in flower.

AMERICAN ALOE.

THE popular notion that this plant blooms but once in a hundred years, is altogether erroneous; but that it is some years before it is large enough to flower is very certain. The truth is, that the plant can be grown to a large size from a sucker in a few years; and if we could spare the room, and the subject were grown in a stove, the flowering could be greatly hastened: but it is, comparatively, a hardy green-house plant, and will stand out-of-doors a great part of the year, and under such treatment grows very little more in seven years

than it could be grown in one season. Let any one who wishes to try the experiment place one in a stove, and see the progress it makes, compared with a similar one put out of doors. It will be soon obvious, that if early maturity were a desirable object, the stove is its place: but it is prized as an object for the lawn, and will bear any degree of cold short of a frost, which kills it outright if allowed to attack it long enough. We have seen one brought up from a sucker, and bloomed in fifteen years; so that the question of a hundred years is out of count altogether. At the same time, it must be allowed that its fellow, that had been in the greenhouse all the winter seasons, and on the lawn through all the summers, had not flowered seven years afterwards; nor had it attained the size at the end of this period which its fellow had attained the year before it bloomed. To the insignificance of the flower, with all its boasted curiosity and grandeur, may be attributed the carelessness with which the growers treat it,

and the disappointment which is naturally felt when a noble plant rises for bloom, because the specimen is thereby destroyed. In point of beauty the Yuccas are superior, because these flowers are larger in proportion to the plant, and much more noble in respect to the general structure. The advent of an aloe blooming is generally much talked of, and the idea of a thing flowering only once in a century induces much curiosity; but we never yet saw the visitors gratified. There has always been an expression of disappointment by those who never saw one before, and those who have, only go to see if there be any remarkable difference between the new one and those which they have before observed. The stem is very tall; the branches, on which the flowers appear by hundreds, are horizontally disposed and somewhat curious; but the individual blooms are so decidedly insignificant, that they hardly of themselves form objects of interest as compared with the stem or the plant.

NEW FLOWERS AND PLANTS.

VANDA SUAVIS, *Lindley* (sweet-scented Vanda).—Orchidaceæ § Vandææ-Sarcanthidææ.—A very handsome epiphytal species, with a stout erect habit, producing on each side the stem stout leathery strap-shaped leaves. The flowers are borne in short loose racemes, and are very handsome; the sepals and petals are spatulate, bent backwards at an angle of about 120 degrees, the petals being so twisted as to present the principal part of their back to the eye; the lip is three-lobed, convex, the middle lobe deeply bifid. The colour of the flowers is white, with reddish-brown marbling and blotching, the base of the lip deep violet, becoming paler towards the apex. The flowers are very durable, and deliciously fragrant. Native of Java. Introduced in 1847, by Messrs. Veitch, of Exeter. Flowers in spring and summer. *Culture*.—Requires a stove; turfy peat soil, in an open pot or basket, or to be fixed to a block of wood; propagated by dividing the plant.

PHAIUS CALLOSUS, *Lindley* (thick-lipped Phaius).—Orchidaceæ § Epidendrææ-Bletidææ.—This species a good deal resembles the pretty well-known *Phaius grandifolius*, or *Bletia Tankervilleæ*, as it was formerly called. It has the same terrestrial habit as that plant, but the flowers are somewhat less numerous; their colour is dull reddish brown, just tipped with dingy white, and the lip is white, with a tinge of pink, a dark purple spot beneath, and a little yellow on the spur, which is two-lobed; the lip is truncate, or almost two-lobed at the end, with a thick callous line passing down the middle. Native of Java. Intro-

duced in 1846. Flowers in March. It is the *Limodorum callosum* (Blume). *Culture*.—Requires a stove; to be potted in turfy peat soil; propagated by division of the plant.

VANDA FUSCOVIRIDIS, *Lindley* (brown-and-green Vanda).—Orchidaceæ § Vandææ-Sarcanthidææ.—An epiphytal species, with the evergreen habit common to this genus. The leaves are two-ranked, and in form long and narrow, cut at the end into two unequal acutish points. The flowers grow in lateral racemes of five or six together; the sepals are oblong, round at the end, and quite flat; the petals clawed, obovate, and slightly crisped at the edges; the colour of these parts is dull brown, with a little greenish yellow on the edge of the petals; the lip is pure greenish yellow, and has two narrow erect lobes at the base, is contracted about the middle, and flattened, roundish, and retuse at the end; there are five furrows on the convex base. The flowers have a fishy smell. Its history is not known. Introduced before 1848. Flowers in spring. It has been flowered by Mr. Bassett, gardener to R. S. Holford, Esq. F.H.S. *Culture*.—Requires a stove; turfy peat soil, in an open basket, or to be fixed to a block of wood; propagated by dividing the plant.

JATROPHA PODAGRICA, *Hooker* (gouty-stalked Jatropha).—Euphorbiaceæ § Crotonææ.—A curious and not unornamental shrub, with a singularly gouty distorted stem and branches, growing a foot and a half or more in height. The stem is much and irregularly swollen at the base, succulent, and pale greenish brown; the branches are also swollen

at the base, and are round, green and succulent; the main stem and the older parts of the branches are marked with the scars of the fallen leaves, almost obliterated, while the younger parts exhibit the much larger scars of recently-shed leaves, having on each side a persistent glandularly-fringed stipule. The leaves, of which only a few appear at one time, and which grow on long petioles, are cordate, peltate, deeply five-lobed, and quite smooth. The flowers grow in a large cyme at the end of the branches, forming a flattish head, four or five inches across; they are small, but numerous, and of a rich orange-scarlet, so that they have a very showy character. Native of Santa Martha, in New Grenada. Introduced to Kew about 1847. Flowers at almost all seasons of the year. *Culture*.—Requires a cool dryish stove, or warm greenhouse; sandy loam, well drained; propagated by planting portions of the stems as cuttings, in sand, allowing them to become a little dried before planting.

ANOPTERUS GLANDULOSA, *Labillardiere* (glandular-leaved Anopterus).—Escalloniaceæ.—A handsome evergreen shrub, apparently not reaching a large size, having stoutish round branches, and rather dark, green obovato-lanceolate leaves, which are borne chiefly at the extremities of the new shoots; in the young state, the leaves are fringed with glandular teeth. The flowers grow in racemes from the axils of the leaves, which they exceed in length, the racemes being at first covered by large membranous coloured deciduous bracts; the flowers consist of six concave petals, which form, as it were, little hollow cups; they are white tinged with rose, and upwards of two dozen are produced in each raceme. Native of Van Diemen's Land. Introduced originally in 1823. Flowers in winter, and early spring. *Culture*.—Probably half-hardy; suitable for a conservatory, or conservatory wall; loam and peat; propagated by cuttings or layers.

THYRSACANTHUS STRICTUS, *Nees Von Esenbeck* (upright Thyrsæ-flower).—Acanthaceæ § Echmatacantheæ-Gendarusseæ.—A very handsome half-shrubby plant, of upright habit, growing from two to three feet high, and branched in the lower parts. The leaves are opposite, a span or more in length, and of an oblong figure, much acuminate at the apex, and tapering also to the base. The flowers are borne on the upper part of the branches, which become elongated into a raceme from a foot to a foot and a half long; the stem in this part is of a purplish colour. Along this stem the flowers grow in pseudowhorls; they are rich scarlet, tubular, approaching to funnel-shaped, with a limb of four ovate, obtuse, spreading segments, the upper

of which is bifid. Native country unknown, supposed to be from Honduras. Introduced from the Continent about 1847. Flowers in February and March. This plant is the *Thyrsacanthus Lemairianus* (Nees); and the *Eranthemum coccineum* (Lemaire); and it would also appear to be cultivated in gardens, under the names of *Aphelandra longiscapa*, and *Justicia longiracemosa*, and sometimes as *Salpizantha coccinea*,—a very different thing. *Culture*.—Requires a stove; peat and loam; propagated by cuttings planted in sand, and placed in a hotbed.

CORYNOCARPUS LEVIGATA, *Forster* (smooth-leaved Corynocarpus).—? Myrsinaceæ.—A tree, growing in its wild state forty feet or more in height, with rounded spreading branches, upon which, according to Mr. A. Cunningham, "the eye of the traveller rests with pleasure, by reason of its rich dark glossy leaves, and highly ornamental growth." The leaves are large, alternate, obovate, entire, and very smooth. The flowers grow in a thyrsæ-like terminal panicle, and are numerous, small, and green. They are succeeded by a plum-like fruit, of which the drupaceous coat, when fully ripe, of a sweetish taste, is eaten by the natives; the nut, or kernel, also, when deprived by steaming and maceration in salt water of the poisonous property it is said to possess, is held in considerable estimation; but if eaten without this preparation, it produces severe spasmodic pains, convulsions, and sometimes death. Native of New Zealand. Introduced originally in 1823. Flowers in May. It is also called *Merretia lucida* (Solander); and *Karaka*, by the New Zealanders. *Culture*.—Requires a greenhouse; peat and loam; propagated by cuttings or layers.

GESNERA LIBANENSIS, *Morren* (many-flowered Gesnera).—Gesneraceæ § Gesnereæ.—A beautiful little plant, growing but a few inches high, with simple or very slightly branched stems, bearing the leaves mostly in the upper part, in a rosulate manner; these leaves are obovate lanceolate, rigid, and somewhat wrinkled or puckered, rough, with minute points, which turn white when dry; they are three or four inches long, and deeply and unequally serrated. The flowers are produced in the axils, on separate stalks, and are tubular, swollen in the middle, a little decurved at the extremity, with an oblique mouth, and a limb of five nearly equal segments; they are slightly hairy, and of a bright scarlet colour. Native of Cuba. Introduced in 1847. Flowers in autumn. It bears the names of *Conradia floribunda* (Paxton); and *Rytidophyllum floribundum* (Van Houtte). *Culture*.—Requires a stove; loam, peat, and sand; propagated by cuttings planted in sand and placed in heat.

MUTISIA ILICIFOLIA, *Hooker* (holly-leaved *Mutisia*).—*Asteraceæ* § *Labiatifloræ-Mutisia-cææ*.—A very pretty plant, valuable from its being of evergreen habit, and forming a good cover against a wall, not being liable to become naked at the bottom. It is a scandent plant, rising to a considerable height, with angular stems and branches, and alternate, oval, rigid leaves, cordate and amplexicaul at the base, and truncate at the apex, where the midrib is extended into a long tendril. The flowers are terminal and axillary, growing singly, with a long cylindrical involucre of loosely imbricated scales, and a ray of few rose-coloured florets, which, though not very showy, are pretty, and very distinct in their appearance. It is a very free-flowering plant. Native of Chili and Coquimbo. Introduced about 1832. Flowers in summer. *Culture*.—Nearly hardy; suitable for a wall, and also for a greenhouse conservatory; turfy peat soil; propagated by cuttings planted in sand, and placed in heat.

MICONIA UROPHYLLA, *De Candolle* (tail-leaved *Miconia*).—*Melastomacææ* § *Melastomææ-Miconiææ*.—A branching shrubby plant of moderate stature, not remarkable for gaiety. The stems are branched, and bear oblong leaves, which are prolonged into a long narrow point, and are marked, as is common to the plants of this order, with several longitudinal veins, or nerves; in this case, there are three of these nerves in each leaf. The flowers grow in panicles at the ends of the branches; they are of rather small size, white, with a bunch of yellow stamens. Native of Brazil. Introduced before 1848. Flowers in summer. It is also called *Rhexia caudata* (Schrank). *Culture*.—Requires a stove; loam and peat; propagated by cuttings planted in sand and placed in heat.

THE ROYAL BOTANIC SOCIETY.

THE Royal Botanic Society having selected a title which leaves the public to suppose that their Committee, at least, have some pretension to botanical knowledge as distinct from horticulture, it behoves that body to exercise some small amount of caution in exhibiting named specimens without having themselves previously examined them. It is far from improbable that, among the fashionable multitude who flocked to the garden on the 14th of June, there may have been some young botanist who went thither, not solely to admire the gorgeous display of exotics, but to verify his own researches in indigenous botany. If this were the case, he must have gone home greatly disheartened, inasmuch as he has now found all the labour that he had bestowed on the mosses and lichens to have been thrown away. On the high authority of the Royal Botanic

Society, all the plants in his carefully studied herbarium are wrongly named. We, however, venture to recommend our young naturalist not to throw up his favourite study in disgust,—he is quite right in his names; the plants which he calls mosses, are mosses, and his lichens are lichens; it is the Society which is wrong: “the dog it was that died.” We will not go so far as to say that any member of the managing Committee is so utterly unacquainted with British botany as even to have glanced at the trumpery collection of cellular plants exhibited on that occasion, and sanctioned its admission; but we do say, that it is not at all to the credit of the body above named, to allow any specimens to be exhibited unless either the sender is entitled to some consideration as a botanist, or, if he be unknown to them, unless his labels undergo a rigid examination by some person qualified to pronounce an opinion as to their correctness. Thus much the fellows of the Society generally are entitled to claim. The origin of these remarks is to be traced to a collection of about fifty dried specimens of mosses and lichens, pasted on white boards and exhibited in the booth which contained the roses—why in this particular locality it is hard to say; unless, indeed, the carpenters who arranged the stands (we take it for granted that the Committee were otherwise engaged at the time) were wits in their way, and constructed from the combined moss and roses a detestable pun. Of these fifty specimens, to the best of our knowledge and belief, *not one was correctly named*; not merely were species confounded, not merely were generic names interchanged; but in *several instances*, plants had names assigned to them which belonged to *another order*! As well as the throng would allow us, we examined the miscellany, and made the following notes:—*Sphagnum acutifolium* was called “*Tortula muralis*,” *Scyphophorus pyxidatus* was called “*Polytrichum nanum*,” *Cladonia rangiferina* in one instance was labelled “*Sphagnum acutifolium*,” in another “*Orthotrichum crispum*,” and a third specimen “*Bryum capillare* :” * *Hypnum capillare* was named “*Polytrichum undulatum*,” another specimen of the same was labelled “*Polytrichum urnigerum*,” *Didymodon purpureus* was marked “*Hypnum cuspidatum*” and “*Orthotrichum striatum*” (sic), &c. &c. &c. As many of our readers, probably, are not cryptogamic botanists, we will bring the enormity of the foregoing blunders fully before them, by translating them into English; we shall then have a

* We could not get near enough to assure ourselves whether the two last were forms of *C. rangiferina*, or specimens of another species: certainly they were lichens.

cauliflower labelled "*Venus' looking-glass*," a white lily, "*snow drop*;" three specimens of daisy will be labelled severally "*American aloe*," "*bullrush*," and "*pæony*;" two turnips will be named severally "*Sweet-william*" and "*clove pink*;" and two plates of gooseberries will figure as "*apples*" and "*cherries*." There is not one atom of exaggeration in the above parallel; we therefore think ourselves quite justified in recommending the Royal Botanic Society either to stop their undignified flirtation and change their names at once, or if they are content with their present condition, to walk somewhat more circumspectly; we profess ourselves lovers of mosses and lichens, and will not allow them to be called by other than their honest names with impunity.



ORCHIDS FOR HOUSE DECORATION.

In the minds of most persons unversed in the mysteries of gardening science, orchidaceous plants and hothouses seem to have a necessary and indissoluble connexion. It is, however, beginning to be experienced by those who are more familiar with these objects than the class of persons just referred to, that this is not really the case. In fact, it is ascertained, not only that many kinds, and some of these among the more handsome that are known of this exceedingly remarkable family, may be grown entirely in an atmosphere by no means oppressively charged with heat; but even that a still larger number may be employed when they are in bloom, for the decoration of living-

rooms, for which purpose, indeed, the peculiar texture as well as elegant appearance of many render them well adapted.

The remarks which follow tend to illustrate this point; they, as well as the engraving at the head of this paper, are taken from the *Gardener's Chronicle*.

"You say, Mr. Reader, that you should like to cultivate Orchids, but that, greatly as you admire them, you cannot encounter the heat and moisture of the houses in which they are grown—that the wetness of the floors, and the drip overhead, so frequently present in them, are sufficient to deter you from entering, and that from want of a more general bloom, they are not adapted for that display of flower you are so fond of witnessing, and which alone repays you for the expense of a greenhouse or conservatory. Let us think over the matter a little, and perhaps whilst I allow many of your objections, I may state advantages which may alter your opinion, and induce you to commence their cultivation. What plant is there that you can bring into the dwelling-house and keep for a week, a fortnight, or even a month in an inhabited room, and in winter time, without injuring it? This may be done with a great portion of the beautiful family we are now speaking of, and with a little watchfulness you will do them good instead of harm. In the accompanying illustration you have a basketful, overflowing with flowers. It hangs, as you will observe, to a bracket fitting into a socket, and attached to the wall above the mantelpiece. It contains *Dendrobium pulchellum purpureum*, a native of the East Indies, and a plant of the easiest cultivation. There it hung and ornamented my room for these two weeks, whilst on the opposite side of the chimney-piece hung that queen of Orchids, the *Phalænopsis amabilis*, with its flowers $3\frac{1}{4}$ inches across, of the purest white, and of the most elegant shape. It is true that at this time of year [April] the weather is mild, but in the depth of winter you could have found me as gay, or more so, if number of plants is considered; for I remember that at one time I had *Lælia autumnalis*, two fine plants, one on each side, a good specimen of a variety of *Brasavola glauca*, a pretty plant of *Odontoglossum membranaceum*, and a basketful of the ever-flowering *Epidendrum Skinneri*. Speaking of the latter reminds me of additional evidence in favour of the value of these plants as ornaments to a room. I once lent a specimen of this species to a lady, to help to adorn her table for a party. Two weeks after, I called, intending to bring it home. I found its flowers as fresh as ever. I well soaked it with tepid water, and left it with her; and two weeks after that had it back as fresh as the day it went from the Orchid-house. To

resume, you will observe that in winter, in the coldest weather, the chimney-shaft has been so warmed with the fire of the day, that it radiates abundant warmth to protect the plants during the night. Experience, that best of teachers, convinces me that Orchids may be safely introduced into such a situation, and their beauty enjoyed, whilst all without is storm and cold. How frequently have I, before retiring to bed, sat with my feet on the fender and my eyes on these lovely plants, and, remembering their native habitat, been transported back in imagination to far distant lands, where, after lying beneath the grateful shade of tropical vegetation, I have speculated on what might be my fate and fortunes in days to come; but never, in my wildest flights of fancy, did I picture myself sitting at an English fireside, with the productions of these burning climes blooming above my head. You

say that your objection is unanswered as to their making no general display. I grant that the proportion of plants in bloom to those not in flower is very small; but then you must remember that in a general collection there are always some displaying their beauties, which, gathered together in a room, as I have attempted to show, will amply reward you for the expense and trouble of the cultivation. And then look at their wonderful character; see that *Phalænopsis*; were I to hide the leaves and flowers, you would say it was only a block of wood with a little dry moss and dead-looking kind of roots upon it, and yet from that apparently lifeless mass spring the broad green leaves and these two spikes of flowers, fit to adorn the brow of the Queen of England herself. Go build yourself a small house and begin, and sure I am that you will please the ladies of your family, if no one else."



GESNERA LIBANENSIS.

GESNERA LIBANENSIS, *Morren* (many-flowered *Gesnera*).—*Gesneraceæ* § *Gesnerææ*.

Among the many species of *Gesnera* which are in cultivation, there are some few of a remarkably dwarf habit, and producing an immense number of flowers. Of that character is the *Gesnera libanensis*, as the accompanying representation, prepared from a beautiful plate recently published in the *Botanical Magazine*, will bear evidence.

Some doubt appears to exist as to the proper generic name of this plant. Sir W. J. Hooker, in the work just referred to, adopts

the name above quoted, which appears to have been applied by *Morren* in the *Ghent Annals*; but he remarks of the plant, that "it ill agrees with true *Gesnera*, rather with certain West Indian species in our Herbaria (*G. scabra*, Swartz, and *G. humilis* and *acaulis*, Linnæus), which are referred to *Conradia* by *Martius* and *De Candolle*, though probably without sufficient examination. No family deserves a more thorough revision than that to which our present plant belongs." In Mr. Paxton's *Magazine of Botany* it is published under the name of *Conradia floribunda*, but nei-

ther does the plant appear to agree properly with this genus, for in *Conradia* proper certain glands are wanting which are present in this plant. The revision to which Sir W. Hooker alludes would probably result in the separation of this and some other species as a distinct genus. Besides these names, the plant has borne in the Belgian Gardens the name of *Rytidophyllum floribundum*, but with the genus *Rytidophyllum* it does not accord either in character or habit.

The species is a dwarf evergreen shrubby plant, of neat habit, growing in fact but a few inches high. The stems are simple, or very slightly branched, and are clothed with smallish but spreading leaves of an obovate lance-shaped figure, collected chiefly on the upper part of the stem in a rosulate manner; these leaves are of a rich green, three or four inches in length, somewhat firm or rigid, wrinkled or puckered, rough on the surface, with minute points, and very coarsely and unequally serrated on the margin. The leaf-stalks are short, but shaggy with rufous hairs. The flowers are produced very freely: specimens two inches high, and four inches across, often have as many as a dozen blossoms at one time expanded, and these last for some time in perfection; they are produced freely from the axils of the leaves, each blossom being attached by a separate stalk, which is hairy, and furnished at the base with long narrow linear bracteas. The individual blooms are half as long as the leaves, but are not at all concealed by the latter; they are tubular, about an inch and a half long, bulging out about the middle, and beyond that somewhat decurved, so that the mouth has an oblique direction; the limb consists of five small spreading lobes, which are rounded, ciliated, and nearly of equal size; the colour is a rich scarlet. "The size of the flower, its deep and rich scarlet colour, and the manner in which it protrudes itself from amongst the fine green foliage, make it one of the prettiest

little things we have lately seen."—So writes Mr. Paxton.

This *Gesnera libanensis* appears to be a native of Cuba, whence it was introduced to the Belgian Gardens, and from thence to the Royal Garden at Kew. A considerable number of a plant bearing this name was also dispersed in London during 1847, at an auction sale of plants brought over from some part of the continent. It produces its blossoms in the autumn and winter months.

A stove temperature is required by this plant to aid its full development. After it has done flowering, it should be kept rather dry and cool, in order to afford it a season of rest; this will happen during the spring months. It may then be repotted, and set growing in a plant-stove or mild hot-bed frame, where it may be placed near the glass, so as to enjoy a pretty liberal degree of exposure to the light. Similar conditions of temperature and exposure to light should be continued, as far as practicable, throughout the period of its growth. A compost of turfy peat and turfy loam in equal parts, mixed with sufficient sand to render it porous, will suit it; or it may be grown in a mixture of loam and light rich vegetable mould, the latter supplying the place of the peat earth and sand. Being altogether a small plant, it must not be overpotted, and the pots must in all cases be well drained; it would be advantageous also to intermix amongst the compost a good proportion of charcoal broken up to the size of nuts. A pot six inches across the top would be large enough for a very large plant; and this ought to have, at the bottom, about two inches thick of materials for drainage. The plants must be moderately, not excessively, watered; and when at rest, rather sparingly than otherwise. It may be increased by planting cuttings of the half-ripened shoots, in sandy soil, placing them in a hotbed frame, and protecting them from the sun. A bell-glass is not at all essential to success.

THE PRINCIPLES OF GARDENING.

WE have been often told that we are opposed to science, because we insist upon the fact, that thousands may be very fond of a garden without understanding botany, and tens of thousands become good gardeners, with no more education than is afforded at a parish school. But we never were opposed to science; we have ridiculed the science displayed by men of no practice, in writing of things they evidently did not understand; and we have had the temerity to contradict professors who, relying upon a theory of their own, give instructions that can never be reduced to practice. Like the English Agricultural Society,

we want practice with science. Drawing-room farmers, and writing gardeners, may mangle the language of science, and fancy themselves authors, because they re-write lessons of better men in other words, and occasionally omit what appear to them unimportant matters, but which, in practice, may make all the difference between success and failure. The principles of gardening cannot be too well understood. Mr. Johnson's work is worth reading and studying, but we do not agree with all he says; indeed it is seldom we can agree altogether with compilers, and in this light we look upon the "Principles of

Gardening." We do not come to an original thought. The brains of others have been woven into something, and the work partakes of the nature of all other theoretical productions. The author, however, avows its origin. He mentions the names of the principal luminaries of horticulture, from Bacon downwards, and then he says :—

"It has been my endeavour to concentrate and arrange the results of the researches of the above-named disciples of nature in the following pages,—adding such rays, derived from lesser lights, as aid to render the whole more luminous, and such links of experiments and observations from similar sources as make the work more connected than it would be without their aid.

"In the arrangement of this work I might have followed the more obvious plan of commencing with a description of the seed, and the promotion of its production; but I found that the order adopted enabled me to pursue more readily, and more progressively, the phenomena and practices to be explained and illustrated.

"A few gardeners may still exist who venture to think science useless—as there once existed a devotee of fashion who wondered why it was not always candle-light; but the great majority of gardeners are now men of science, endeavouring thoroughly to understand the reason of every practice, and the supposed cause of each effect. To those differing from them I might name, if it would not be invidious, nearly all the most successful of our modern gardeners. To a man, these are well acquainted with gardening's relative sciences. I forbear from mentioning names, but I may remind my readers, without fearing to offend, of two departed *savans*, M. Lavoisier, and our fellow-countryman, Mr. Knight. Lavoisier, the Linnaeus of chemistry, cultivated his grounds in La Vendée on scientific principles, and in a few years their annual produce doubled that from equal spaces of his neighbours' soil. Mr. Knight has scarcely left a department of our horticulture unimproved, by that combination of scientific with practical knowledge which he, perhaps more than any other man, had united in his own mind.

"It behoves every gardener to follow in their steps, for though the great men who have gone before have done much for gardening, yet still more remains to be accomplished. We still, on most points, do and must ever, see through a glass darkly; but that is no reason why any one should refrain from the effort to elicit a ray towards diminishing the obscurity—and we may all, without fear of mispending our labour, continue to act as if botany could still furnish something new, and

as if chemistry and physiology had still some secret to reveal to the inquirer."

The work of compilation is always tedious, and some minds are calculated for it, while others disdain a task which appears the journey-work of literature; nevertheless, such men are useful. Mr. Loudon has in his "Encyclopædia of Gardening" given us nearly all that has been written to the point on the culture of many plants; so far we have a valuable book, in which we find what we could only otherwise attain by taking down a hundred-weight of books from the shelves, even if we could find a library that contained them all, which is very doubtful. Mr. Johnson has, in this book, concentrated as much information as would cost us months of labour to get at, if we wanted to get at it. He begins with "sowing," and gives us an account of the seeds and their nature; from this he proceeds with the root, stem and branches, the leaves, sap, flower, fruit, and seed; diseases of plants, death, and decomposition. In the article on sowing, we are favoured with Mr. Loudon's list of the greatest age at which certain seeds vegetate, namely :—

"*One year.* Peas, beans, kidney beans, carrot, parsnip, oraches, herb-patience, rhubarb, elm, poplar, and willow.

"*Two years.* Radish, salsafy, scorzonera, purslane, the alliums, cardoon, rampion, alexander, love apple, capsicum, egg-plant.

"*Three years.* Sea-kale, artichoke, lettuce, marigold, rue, rosemary.

"*Four years.* Brassicas, skirret, spinach, asparagus, endive, mustard, tarragon, borage.

"*Five and six years.* Burnet, sorrel, parsley, dill, fennel, chervil, hyssop.

"*Ten years.* Beet, celery, pompion, cucumber, melon.

"Now in this list generally, as already observed, those with the most of nitrogenous matters among their component parts, are the first to decompose, and consequently lose their vitality; and those with the greatest amount of starch and lignin, or more carbonaceous constituents, retain their germinating power the longest, and for the evident reason, that such are less prone to decay."

—useful information, though we had before received it from Mr. Loudon. On the subject of cross-breeding, we give a few lines, which shows that scientific gentlemen are not always right :—

"14. Plants nearly related, that is, closely similar in the structure of their various parts, are those only which will *immediately* impregnate each other; but it is impossible, at present, to say what families of plants may or may not

be brought into fertile union through intermediate crosses. A very short time ago the azalea and rhododendron were thought incapable of such union, but this opinion is now exploded, for *Rhododendron ponticum* has been fertilized with the pollen of *Azalea sinensis*, and the progeny between that evergreen and this deciduous shrub is the previously unknown phenomenon, a yellow rhododendron. Though such unions may be effected, I entirely agree with Mr. Knight in anticipating that the progeny will be mules, incapable of producing offspring. It is quite true that many plants, said by botanists to be distinct species, have between them produced fertile seeds; but I incline decidedly to the opinion, that this fact demonstrates that they are not distinct species, but only deviations from a common origin. For example, the peach and almond are considered distinct species by botanists, yet the fruit of both and of the nectarine have been borne spontaneously by the same tree. 'I cannot,' says Mr. Knight, 'by any means admit that plants ought to be considered of originally distinct species, merely because they happen to be found to have assumed somewhat different forms or colours in an uncultivated state. The genus *Prunus* contains the *P. armeniaca*, *P. cerasus*, *P. domestica*, *P. insititia*, *P. spinosa*, *P. sibirica*, and many others. Of this I feel perfectly confident, that no art will ever obtain offspring (not being mules) between the *Prunus armeniaca*, *P. cerasus*, and *P. domestica*; but I do not entertain much doubt of being able to obtain an endless variety of perfect offspring between the *P. domestica*, *P. insititia*, and *P. spinosa*; and still less doubt of obtaining an abundant variety of offspring from the *P. armeniaca* and *P. sibirica*. The former, the common apricot, is found, according to M. Regnier, in a wild state in the oases of Africa. It is there a rich and sweet fruit of a yellow colour. The fruit of the *P. sibirica*, seeds of which came to me last year from Dr. Fischer of Gorenki, is, on the contrary, I understand, black, very acid, and of small size: but nevertheless if these apparently distinct species will breed together, and I confidently expect they will, without giving existence to mule plants, I shall not hesitate to pronounce these plants of one and the same species, as I have done relatively to the scarlet, the pine, and the Chili strawberries. Botanists may nevertheless, if they please, continue to call these transmutable plants, species; but if they do so, I think they should find some other term for such species as are not transmutable, and which will either not breed together at all, or which breeding together give existence to mule plants.'

Here we have it said on the authority of

Mr. Knight, but with the author's avowed opinion that he was right, that offspring of the azalea and rhododendron would not seed. We remember well Mr. Smith of Norbiton affirming the contrary, and he raised a vast number of the yellow rhododendron by means of the yellow azalea. With one more extract we shall close our notice. It is interesting, as well as instructive to very young gardeners, but familiar enough to the mass:—

"Scarcely an annual exists which usually dies at the close of the season, after ripening its seed, but may be made to retain a vigorous existence if its inflorescence be removed as speedily as formed. Mignonette is a very familiar example, for this may be allowed to bloom, but if its flower stalks be cut down before the seed-vessels are perfected, it becomes woody and shrubby, and will live and bloom for three or more successive years. If allowed to ripen its seed, it dies the same autumn. The common nasturtium is an annual; but the double nasturtium, says M. De Candolle, has become a perennial, because its flowers, deprived of the faculty of producing seeds, do not exhaust the plant, and it is probable that every annual, rendered double by cultivation, will become a perennial.

"This explains why fruit trees are weakened, or rendered temporarily unproductive, and even killed, by being allowed to ripen too large a crop of fruit, or to 'overbear themselves,' as it is emphatically termed by the gardener.

"The thinning of fruit is, consequently, one of the most important operations of the garden, though one of the least generally practised. On the weaker branches of the nectarine and peach, an average space of nine inches should be between each brace of fruit, and on the most vigorous wood of the most healthy trees, they should not be nearer than six inches. This enforcement of the importance of thinning fruit, is not intended to be confined to the two trees specified; it is equally important to be attended to in all other fruit-bearers, but especially the vine, apricot, apple, and pear. It should be done with a bold, fearless hand—and the perfection of that which is allowed to remain will amply reward the grower in the harvest time for the apparent sacrifice now made. But he will not reap his reward only in this year; for the trees thus kept unweakened by over-production, will be able to ripen their wood and deposit that store of inspissated sap in their vessels, so absolutely necessary for their fruitfulness next season."

We thank Mr. Johnson for taking a good

deal of pains to produce a book that is not ill adapted for schools; there are many good lessons worth learning, and to give it to a youth, would be to make him begin at the

right end of gardening, that is, to make him understand why this operation produces that result, and so make him well acquainted with the means of accounting for every thing.



MUTISIA ILICIFOLIA.

MUTISIA ILICIFOLIA, *Hooker* (holly-leaved Mutisia). — Asteraceæ § Labiatifloræ-Mutisiaceæ.

An illustration of this plant was published some years ago (1829) in *Hooker's Botanical Miscellany*, and recently another has appeared in *Paxton's Magazine of Botany*; the former having been made from dried specimens preserved from the wild plants, and the latter from plants which appear to have been for some years growing in the climate of Scotland. Though not a very showy subject, it is quite desirable in gardens, from its distinct and striking habit and appearance. The engraving we have provided represents a portion of a flowering shoot detached from its root.

Of this pretty genus there are several known species, and three are said to be introduced to English gardens, but neither of them are at all common; indeed, they are very rarely seen. Nevertheless, they appear to be all curious plants, which would be very desirable objects of cultivation.

The present subject is a plant of scandent or climbing habit, and grows to a considerable size and height under favourable conditions. It is, moreover, a neat grower, producing numerous branches, and an abundance of its blossoms. Both the stems and branches

are somewhat angular, and are furnished with leaves of a very singular form and character; they are borne alternately along the branches, and are of hard leathery texture, oval, with the base cordate and clasping the stem, the margin deeply cut with spinous teeth, and the apex truncated, or cut off nearly at a right angle with the midrib, the latter being prolonged beyond the leaf into a tendril three or four inches long. The flowers, or flower-heads rather, are large and showy, and grow singly at the end of the principal and all the little lateral branches. In this and all composite plants, what is called the flower is in reality a little bunch of flowers. The structure is thus:—On the outside is a series of several rows of scales, which form what is called the involucre; in this case there are three or four rows of these scales, which are of a broadly ovate figure, with a lanceolate apex, and are loosely placed in an imbricated form, forming a cylindrical involucre. Within this involucre is placed a row of strap-shaped florets—as the individual flowers of composite plants are termed—which are two-lipped; the larger lip flat, standing outwards all round, and the other towards the centre, not very apparent: these florets, of which there are from eight to ten in the row, are of a pretty

rose colour. In the interior of these again, is a centre of erect tubular yellow florets, which become two-lipped, with projecting anthers. When fully expanded, these flower-heads are upwards of two inches across.

The species is a native of Coquimbo, and also of Chili, from whence it appears to have been introduced to this country by Mr. Low, nurseryman of Clapton, some few years since. It has not, however, become common, although it has many qualities to recommend it:—It is evergreen; it is nearly hardy; its habit is good, not being liable to become naked at bottom; it flowers very freely; it is well suited for a wall. It appears that Mr. Roy, jun., of Aberdeen, has had a plant for some years against a south wall in his garden, where it has stood with no other protection than the wall itself has afforded, and flowered freely every year. If it will do this at Aberdeen, it will do so in any part of the United Kingdom.

As to soil, it appears to prefer good peat without any admixture, unless indeed it be a little sand to render it porous, if it be at all of an adhesive character. In soil of this kind, if placed in other respects under suitable conditions, it will make annual shoots of four feet in length. Good turfy peat soil is the best material, therefore, that can be had as a medium for its roots; and this should be well drained by artificial means, wherever any, the least, necessity for such artificial drainage exists. The success of exotic plants not quite hardy, when placed in the open air of our climate, supercharged as this is with moisture at the periods most trying to vegetable life, lies almost entirely in the perfect manner in which any kind of superfluity at the root is removed. There are, of course, many means of effecting this end which are locally preferable, but one of the best is to place the compost for the roots on the original surface, making provision at the same time for the removal of anything like stagnant moisture.

Propagation may be effected by cuttings, planted in the usual way, in sand, and placed under glasses, in a situation where there is a mild bottom heat of sixty or seventy degrees, the usual precautions being observed to prevent the cuttings perishing from accumulated damp. When once established for a few years, the plants are said to be removed with difficulty.

There are two situations, at least, to which this may be introduced with propriety. One is, against a conservatory wall, in company with other choice flowering plants. Here, of course, every precaution must be taken to remove the excess of moisture from the soil; and the branches should be regularly trained, and moderately thinned if they become too much crowded in any part. It does not ap-

pear that any protection is required, although, if the situation is naturally at all unfavourable, it may be well to protect to some slight degree. The other situation is as a climber on the pillars of a conservatory where such plants as camellias, acacias, roses, in fact, hardy greenhouse plants, only are grown. For this, its evergreen habit, curious foliage, and pretty flowers, would make it very desirable.

AN ABSTRACT OF REPORTS, PAPERS, AND PROCEEDINGS OF THE HORTICULTURAL SOCIETY, WITH ORIGINAL NOTES BY F. H. S.

TROPICAL FRUITS.—Not to mention our pine-apples, which are said to surpass in flavour those of the West Indies, the Longan is recorded in the second volume of the Transactions of the Horticultural Society to have ripened its fruit at Mr. Knight's, of Lee Castle, near Kidderminster, in 1816; the fruit of the Loquat has repeatedly been perfected in England; at Wynnstay, the seat of Sir Watkin Williams Wynn, the Banana frequently produces its bunches of yellow fruit; and the Chinese Guava and Yellow Jambu regularly bring forth their crops in Mr. Cattley's conservatory at Barnet.

CULTURE OF THE PERSIAN MELON, BY T. A. KNIGHT, Esq.—Experiment on the Melon.—The variety of Melon which I proposed to cultivate, was a Persian kind, chiefly grown in the vicinity of Ispahan whence it takes its name. Its form is nearly that of a cucumber, acquiring frequently more than a foot in length, and weighing about seven pounds. It possesses, in my estimation, very great excellence as a fruit; but it is of very difficult culture, the blossoms not setting freely: and the fruit, on account of the excessive thinness of its skin, being very subject to decay prematurely in the damp atmosphere of an ordinary hot-bed: and I had, on these accounts, for some years wholly ceased to cultivate it.

My plants were not planted till late in the spring, and therefore did not produce blossoms capable of affording fruit till the second week in July; and it had to grow and ripen under a very cloudy sky. Each plant was placed by itself in a pot of about eighteen inches in diameter in its widest part, and of about a foot deep, inside measure, the mould in them being very rich and light, and constantly kept sufficiently moist with manured water; and the number of pots was equal to the number of Melons which I proposed that my hot-bed should contain at one time. These pots were supported at the south and lowest side of the bed, about fourteen inches below the glass roof; and the plants were trained

upon a trellis at the same distance from the roof, and parallel to it. By these means, and by giving to each plant a similar extent of space, I expected to see each Melon swell, and be equally well fed and ripened; and I calculated upon the further advantages of being able to give, or to withhold, water from each plant according to the state of growth, or approaching maturity of its fruit: and also upon that of being able to introduce other pots and plants, as soon as I had gathered the produce of each plant. My success in every respect wholly exceeded my expectations, the bed proving an instrument of much greater powers than I had calculated upon; and I was assured by Sir Harford Jones, who first supplied me with seeds of the variety, (which he had brought from Persia,) that he had never seen plants of more healthy growth, nor with fruit better swelled, even in its native climate. The only enemy with which the gardener will, I believe, have to contend, is the red spider, and against the attacks of this he must guard his plants, by frequently sprinkling their leaves lightly with clear warm water.

I had a singular opportunity in this experiment of obtaining evidence of the truth of an opinion, which I gave many years ago, that every leaf, even the most distant, of a Melon-plant, contributes to feed its fruit. One of my plants exhibited appearances which led me to conclude that a fruit was set, and was swelling rapidly upon it. My gardener, on the contrary, was very positive that no such fruit existed; and having myself searched in vain to find it, I was compelled to relinquish my opinion; this however I resumed upon observing the habit of the plant two days afterwards, when I ordered the lights to be taken off, and every branch to be minutely examined; it was then discovered, that a Melon, at the extremity of a straggling branch, had fallen through the trellis, and was hanging half a yard below it. In this situation, it had been entirely shaded by the crowded foliage of another plant; but nevertheless it had grown in less than fourteen days to be nearly a foot long, and it weighed at least four pounds. That it had derived the material necessary to its rapid growth from the sap of the parent plant cannot, I think, be doubted: and the evidence that the most distant part of the plant contributed to feed it, is certainly extremely strong; for the fruit grew at the distance of at least six feet from those parts of the plant which led me to infer its existence.

I have at different periods made an immense variety of experiments to ascertain by what organs, and under what circumstances, the lifeless inorganic matter, which is absorbed by the roots of plants, becomes converted into their true sap, or living vegetable blood; and


the result of every experiment has led me to believe, that in all cases where plants possess leaves, as distinct organs, it is in such organs alone, and under the influence of light, that this process takes place. The powers, which roots of various forms and cuttings, and other detached parts of plants, possess of emitting foliage, have appeared to me wholly, in all cases, dependent upon the presence of true sap, previously deposited within them. Like the cotyledon of seeds, they appear to be reservoirs only, which contain but never create: and it has been long ascertained that seedling plants perish, or at best scarcely retain life, if deprived of their cotyledons, even after the radicle has penetrated deeply into the soil, and the elongated plumule has reached its surface; a discovery which appears to be universally given to Bonnet; but which belongs to Malpighi.

In an experiment which I made some years ago, a single Melon, of the Rock Canteloup variety, grew upon a plant which occupied more than thirty feet of the surface of a hot-bed, but under green grass of ordinary quality, where it acquired the weight of thirteen and a half pounds, having during its growth given the whole plant full employment, and apparently put the services of every leaf into requisition, though some of them grew at nearly six feet distance from it.

[There does not appear to us to be anything extraordinary in this matter. On wall fruit trees, and on standards, the finest fruit is almost invariably found to be those most distant from the root, and if the fruit takes all the nourishment, it is not at all surprising that the portion of the plant nearest the root should feel the lack of that return of sap of which some theorists talk so much.]

GRAFTING AND BUDDING ROSES; BY JEAN BAPTISTE VAN MONS, M.D.—Van Mons says, for grafting, scions are used of such a thickness that when fitted they may equal the stock in diameter; by making the slit short of the axis of the stock, the slenderest scions may be used. The scion is to be cut on both sides, so as to form an elongated wedge, and the bark of the stock must be made to fit the graft on both sides; a ligature is afterwards applied, of fine bass, made water-proof by pressing it first through a solution of white soap, and next through one of alum. The ligature is finally covered with a coat of marly clay mixed with old slaked lime, and moistened with white of egg beat up with four or five parts of water. This material is applied with a hair pencil. The best stocks for this mode of grafting are the shoots of any kind of Garden Rose.

We employ in Flanders the same mode of grafting with the Dog-Rose, only taking the precaution that the cleft be of sufficient depth

to allow the cut edge of the scion, which is immediately above its cut part, to rest firmly upon the wood of the stock. The ligature in this case is of bass, and we cover it with white mastic, made of Burgundy pitch, white wax, and boiled turpentine, with or without a little white size. Black mastic imbibes heat too much when exposed to the sun. The Rose may be budded very well in the spring, if the buds are extracted with a small portion of wood adhering to them. For this purpose scions are cut before winter, and stuck into the ground, till the moment when in spring the bark of the stock will run. To prepare the bud we make, firstly, a transverse cut into the wood a little below an eye, which incision is met by a longer cut downwards, commencing at a short distance above the eye, care being taken that a portion of wood is removed with the bark; this bud is inserted into the bark of the stock, which is cut like an *inverted T* thus,  the horizontal edges of this cut in the stock and of the bud must be brought into the most perfect contact with each other, and then bound with water-proof bass, without however applying grafting clay. Eight days after the insertion of the bud, the stock is pruned down to the branch, which is immediately above the bud on the opposite side, and this branch is stopped by being cut down to two or three eyes; all the side wood is destroyed, and when the bud has pushed its fifth leaf we compel it to branch by pinching its extremity; it will then flower in September of the same year. You may also bud the Rose in the spring, without waiting till the bark separates, by placing the bud with some wood on it in a niche made in the stock, similar to what would be formed by taking an eye for budding from it in the manner above described, and into which it is fitted exactly with a slight pressure. It is recommended to make the cut for the niche where there is already a bud on the stock; when placed, the bud is then bound with bass and covered with mastic.

For budding in June, I deprive the young shoots of the plants I desire to cultivate, of their leaves, and fifteen days afterwards the eyes at the axils of the leaves are sufficiently swelled to allow of their being taken off, and inserted as buds. The shoots from these buds often bear even in the same year many flowers. In August and September, we insert our buds upon stocks that have not been pruned; they are placed upon the old wood, not only because we bud low, but because this succeeds best. Whatever be the period at which budding is done, if the plant be well pruned on all its branches the bud does not fail to push. The scion of a Rose tree is seldom too dry to take, when the bud is inserted with a thin bit of wood behind its eye.

I have thus budded successfully from scions that had remained in a drawer for ten days. When cuttings for buds are to travel, I pack them in long grass, and surround them with straw disposed longitudinally. We prefer to graft and bud our Roses not more than six inches above ground, firstly, in order that the whole head of the bush may be exposed to the eye of the observer, and, secondly, because the union is more certain, and the plant keeps the earth about it moist by its own shadow. Besides, it often happens, in bending down the stem of high plants, to see their flowers, that their stem is injured and the buds displaced by the curiosity of persons desirous of minutely examining them. At the pruning season, the branches of the budded plants which are formed into a head, are annually cut down to nine inches in length, and we do the same thing with our roses which are not budded; we thus obtain a great deal of young wood, and a bushy plant, as well as a very large number of flowers. The pruning is performed at the end of January; all the four-year old wood is cut entirely back, and the plants themselves are taken up and renewed at the end of eight years. Whenever we wish to make our Roses flower in the autumn, we prune them back in the spring, as soon as we can discover their flower-buds. In order to obtain stocks, we take from the woods and hedges suckers of the Dog-rose, which is very abundant in Flanders, and which, like every other tree or shrub increasing itself spontaneously, has its roots bent like that of a layer. We select plants without lateral branches, and take them up before winter, to be planted into their places after the winter, and we cut down the stem to a foot and a half in length. The stocks make suckers most usually the year after budding, but afterwards in greater quantity; we do not destroy these suckers, but in the following spring we lay them down to the depth of an inch or more, and leave only the end of the sucker above ground. Each eye forms a cluster of roots, and furnishes a very fine stock, which is taken up after winter.—Letter by J. B. Van Mons.

[There is no plant that will bear more liberties taken with it than the Rose; budding, root grafting, and grafting after every other fashion, may be done with impunity; sharp knives and close fitting are all that can be required. We have never succeeded very well in budding upon the old wood, but a sort of bud grafting that is, when some of the wood is attached to the bud, answers well.]

CULTIVATION OF MESEMBRYANTHEMUMS; BY MR. W. MOWBRAY.—In the spring of 1821, I planted out as many plants as filled three lights, putting nine or ten under each light, of different sorts, such as *inclaudens*, au-

rantium, perfoliatum, deltoides, barbatum, and other species of different habits; the strong growing kinds were put towards the back, and the dwarf ones in the front. They soon grew very vigorously, and flowered exceedingly well, having a very different appearance from that they exhibit when confined to small pots; many of them continued in blossom all winter, and until the spring, when I gave them a good thinning, for they were spreading over each other, and mixing together. At that time I planted the remainder of the pit, which is forty feet long and four feet wide in the clear; I also covered the surface with stones of different sorts, which were laid irregularly so as to resemble rock-work: the stones had the effect of keeping the branches from the soil, which might otherwise decay them.

In winter the whole must be covered with lights, and occasionally with mats, as pits in front of houses usually are, but these are not necessary in summer, as the plants must be fully exposed to the free air, the same as hardy greenhouse plants, and require little more than thinning and plenty of water. Pits in front of stoves must be preferred, as the warmth from the front wall in winter will repel damps, and with a little covering above the glass, will sufficiently keep out the severest frost.

I was induced to attempt the above mode from observing that ice-plants grow to perfection on small hillocks of rich mould, supported by stones put together in imitation of rockwork, two or three feet high, with a base of about four feet diameter; these banks look well when the plants cover them entirely. I have cultivated ice-plants in this manner with success, every year since I have been at Arley Hall.—*Read Dec. 1822.*

NYMPHÆA RUBRA.—As this has been considered difficult to bloom, the following may be interesting:—The *Nymphæa rubra* had been grown in the pine-stove at the Earl of Grosvenor's for many years, but never produced blossoms, owing, as I considered, to its being too far from the glass, and the temperature of the pine-stove being generally too low for the development of its flowers. With this impression on my mind, in December 1826, when its leaves were decayed, I took up the bulbs, or tubers, out of the stone cisterns, in which they had grown for years, and put them into pots according to the size of the tubers, and plunged the pots in water to within an inch of their rims. They remained in this situation in the pine-stove, till the plants began to show leaves in the April and May following. They were then planted in cisterns, and in glazed earthen-ware pots, in which were the following soils;—in the bottom,

four inches of strong clay, made solid, above which was six inches of light mellow loam, and, at the top, an inch or two of sand, to keep the water clear. The cisterns, which are made of Yorkshire flags, and of the following dimensions,—three feet long, one foot eight inches broad, and one foot four inches deep, were placed upon the end flues of pine-pits, where the fire enters and escapes: and they were elevated with bricks to within eight and twelve inches of the glass. The glazed pots were from fourteen inches to eighteen inches in breadth and depth, and were similarly placed, except a few that were plunged in corners of the Melon-pits. They were kept constantly full of water, and it frequently was made to run over, in order that the water might be kept pure. The temperature of the pits was seldom under 80°, and in sunshine often above 100° of Fahrenheit. No air was admitted at the lights immediately above the plants. As the plants increased in growth, they put out many runners, which were pinched off close to the tuber. When the roots reached the clay, the leaves got very strong, raising themselves on the sides of the cisterns. The *Nymphæa corulea* and *N. odorata*, under similar treatment, produced abundance of flowers. The first flower of the *rubra* opened on the 13th of August; on the 15th, it was fully expanded, and measured over the disk five inches and a quarter: on the 17th, Sir Abraham Hume saw it, and said it was much larger and finer than any one he had flowered, or ever saw. The same plant produced another flower in September, somewhat larger, and with nineteen petals; and many more buds were formed, but they opened very indifferently towards the end of September; in October, the plants began to lose their leaves. When this was accomplished, the tubers were taken out of the cisterns, and put into small pots as before stated.—*C. DUFF.—Read Dec. 1827.*

[All plants that belong to open situations in their native state, require that they shall be close to the glass; there are no exceptions to this rule. Those plants which grow naturally in shady places may do at a distance from the glass, and for the most part succeed well in a grapery in the shade of the vines. Many orchideous plants are of this nature; but almost all the finely blooming aquatics are exposed in their native place to the sun, and the more closely the glass approximates to the surface of the water, the better will be the growth, and the greater the chances of success.]

PROTECTING CAULIFLOWER PLANTS DURING WINTER; BY MR. JAMES DRUMMOND.—My pits are mostly made in a south and east border, in an inclosure, or yard which I have for hot-beds, composts, &c. the fences of

which afford good shelter from the cold quarters. To form the pits, I first make the ground as level as I can, and as firm as possible, by trampling in wet weather ; I then cut them out ten feet in length by four in breadth, making the sides and ends as firm as possible by beating the soil when wet with the spade. The depth of the pit is according to the description of plants to be kept in them. Nine inches is sufficient for Cauliflower plants, and for these, care must be taken that a sufficient quantity of proper soil is left, or placed, in the bottom of the pit in which they are to be pricked out. Each pit of the above dimensions holds about four hundred Cauliflower plants. For plants in pots, the depth of the pits must be proportioned to the height of the plants, the tops of which must, when placed in the pits, be below the level of the surface of the ground. The frames proper to cover these pits are twelve feet in length by six in breadth ; I prefer them of that, to a larger size, for such can be conveniently carried where wanted, between two men, and can be easily opened and shut, to give light and air to the pits, by a single person. The timbers to form the sides and ends of the frames are required to be about three inches square, and quite straight. These, when joined together, are placed on a level floor, and slips of timber, two inches in breadth and one in thickness, are nailed lengthways on them, at intervals of nine inches. When the timber work is finished, the straw is fastened on in layers in the manner of thatch, and tied to the bars by rope-yarn. The straw used is what is called in this country *reed* ; it is prepared by taking the wheat in handfuls out of the sheaf, and beating it against a door firmly fixed on edge ; by this method of threshing, the straw is very little bruised except at the points, and is consequently preferred for thatching. The frames are always kept under shelter in summer, being perfectly dried before they are put up, and with proper care will last for several years. When the plants are put into the pits, the frames are laid over them. My method of giving air, is by placing in the ground, near the centre of each pit, a forked stick, about four feet or more in length, strong enough to support the frames, when raised like the lid of a box, to a sufficient height, and they remain in that position night and day, unless when actual freezing takes place, or when frost is expected in the night. I am far from thinking that these straw frames will bear a comparison with glass, for neatness of appearance ; but they have other advantages besides their cheapness ; when they are raised, the plants in the pits have the full advantage of air and sun, and are but little exposed to wet, the rain being mostly thrown off on the back of the

frames, and when they are shut down, frost cannot easily penetrate through them to the plants. It is well known that it is necessary to have mats and other sorts of coverings over glass in severe weather, the removing of which, to give air in the middle of the day, and replacing at night, is attended with much trouble ; whereas the opening and shutting of the straw frames is but the work of a moment. I have principally used these pits and frames for the protection of Alpine and other plants usually kept under glass without fire heat ; but in cases of necessity tender greenhouse plants may be preserved through the winter in them, as I experienced last season. I had many Geraniums and other tender plants which I could not find room for in the glass houses. By way of experiment, I placed them in these pits ; and although from the unusual severity of the winter I was obliged to keep down the frames night and day for a fortnight together, and cover them with additional straw to exclude the severe frost, the only plants that suffered were a few of the downy-leaved Geraniums, and even those, on being planted afterwards in the ground, shot out vigorously in the spring at every joint.—*Read May, 1823.*

[Although it may be well to know all sorts of contrivances for the wintering of plants, the cheapness of glass is rapidly superseding all these makeshifts.]

PRODUCTION OF HYBRID VEGETABLES.—The vegetable kingdom may certainly be greatly enriched by artificial intermixtures, and I think that new plants may be so formed, which will be capable of reproducing themselves, as distinct generations, by seed, in the same manner as natural species. I suspect that in the early periods of the world, there existed only the distinct genera of plants, or heads of families, not, however, exactly according to the present divisions of Botanists ; *who, indeed, are perpetually at variance with each other, as to the features which are sufficient to constitute a variety, a species, or a distinct genus.* The lapse of centuries and diversity of soil and climate have probably wrought the most wide and permanent distinctions between vegetables, that have originated from a common stock, possibly even between the arborescent Ferns of the Andes, and the herbaceous inhabitants of our forests ; but I should neither decide, if I found it impossible to produce a fertile offspring from the intermixture of any two plants, that they must have been distinct from the commencement of the world ; nor, if I did succeed in procuring it, that they must not at present rank as distinct species of vegetables ; I should merely think, as the botanist would probably have already decided, that they were referable to one genus, or

family. I apprehend the whole mystery to be this; that, in the progress of the distension of genera into various species, some species have retained such affinity as to admit of easy artificial intermixture; others have preserved so little affinity as to render their union more difficult; and others have departed so widely from their prototype, that the art of man cannot now reconcile them, and that to bring them together again, it would be necessary to tread back or reverse the process of the centuries that have worked their difference. To which may be added, that in some plants the variation may be striking in many external appearances, and yet less considerable in the parts of fructification than in other species, of which the leaf or corolla may be more similar. If it be admitted, that diversity of species could have been produced by variations of soil, temperature, or humidity, it will be readily understood that such diversity might have been further multiplied by hybrid intermixture, as the species were brought together by the natural progress of their diffusion. Mr. Knight has raised fertile strawberries from the mixture of the Chili, the Carolina, and the Scarlet Strawberries, which some persons had deemed to be distinct. But this division was probably erroneous, for we find that they will intermingle naturally, and become confounded by seminal variations, without any artificial impregnation, and therefore it was a pretty clear case that they had been improperly separated. On the other hand, Mr. Knight has failed, as yet, of producing a fertile plant between the American and European Strawberries; but are we to conclude from that circumstance, that plants, so nearly allied as the Scarlet and Alpine Strawberries, were from the creation of the world distinct, and at the same time hold that all the African Gladioli, between which (permanently dissimilar as they are in appearance) I can raise fertile intermixtures, were originally one species? Such an opinion would be so paradoxical, that it would require to be supported by very clear proof; and yet it would be difficult, by experiments, in any manner to confirm it.—*Read Dec. 1819.*

ON RAISING NEW VARIETIES OF THE PEACH.—Mr. Knight, who was so successful in raising new fruits, gives the following lesson for those inclined to follow his example; so far as this indefatigable horticulturist pursued his course, he was eminently successful, and the hint contained in the following abridgement of one of his letters will be found highly useful:—

“In efforts to obtain new varieties of fruits of other genera, I have had reason to conclude, from the success of former experiments, that the trees, from blossoms and seeds of which it

is proposed to propagate, should have grown at least two years in mould of the best quality; that during that period they ought not to be suffered to exhaust themselves, by bearing any considerable crop of fruit; and that the wood of the preceding year should be thoroughly ripened (by artificial heat when necessary) at an early period in the autumn; and if early maturity in the fruit of the new seedling plant is required, I think that the fruit, within which the seed grows, should be made to acquire maturity within as short a period as is consistent with its attaining its full size and perfect flavour; those qualities ought also to be sought in the parent fruits, which are desired in the offspring; and the most perfect and vigorous offspring will be obtained, of plants as of animals, when the male and female parent are not closely related to each other. The varieties of the Peach, from which I first propagated, (says Mr. Knight,) were the large French Mignon, and the little red Nutmeg, using the stigmata of the former, and the pollen only of the latter. The trees of each variety had been removed early in the Spring of the preceding year, from pots of moderate size into others which were very large, and were filled with mould of the most favourable quality that I could compose; and in these pots the plants had grown with excessive vigour. The aid of artificial heat was employed in the spring of 1802, to enable the wood and blossoms of each plant to acquire the most perfect state of maturity in the succeeding autumn; and during winter the pots were defended from severe frost, that the minute fibrous roots of the plants might be wholly preserved; and as the spring approached, the trees were kept in as low and equal a temperature as possible, that the powers of life in the plants might not be prematurely excited into action, nor in any degree uselessly expended. Nevertheless, owing to the wood and buds having acquired maturity early in the preceding autumn, and an accumulated excitability from long rest and cold, the blossoms began to swell rapidly on the first approach of spring, and very early in March it became necessary to place the trees in the forcing-house, the blossoms being so far advanced as to be subject to some danger from frost.

“As soon as the blossoms had fallen, the fruit was ripened under every advantage of heat and light that I could command, the glass having been taken off every favourable hour during the last swelling of the fruit, to admit the solar rays without its intervention. Three French Mignon Peaches only were suffered to remain on each tree, and six of these (which attained the greatest state of perfection), afforded me eight plants in the succeeding spring. Of the new varieties thus obtained,

three are very early ; but I have not had an opportunity of comparing their time of ripening with that of the earliest old varieties. For the red Nutmeg Peach did not succeed at all in my garden, and the blossoms of the early Anne were wholly destroyed by the unfavourable weather of the spring of 1807, and the following year. Two of the new varieties, however, ripened ten days before the Royal George Peach, and three weeks before the red Roman Nectarine, which grew on the same wall, and adjoined the seedling trees, and therefore I conceive these not to be much later varieties than their male parent, which they strongly resemble in colour, and in the form and character of their leaves ; but their fruit is much larger, many having exceeded seven and a half inches in circumference. The fruit of each of the new varieties is soft and melting, and very readily quits the stone, and I thought the flavour of one of them quite equal to that of any Peach which my garden produced. In their leaves and fruit, every tree forms a perfectly distinct variety, and even where the same stone contained two plants, they bear very little resemblance to each other.

"In the present spring I exposed all the seedling plants without any covering, to ascertain the comparative degrees of hardness of their blossoms, and in this respect I found them to differ very widely. The blossoms of two of the varieties appear, however, to be very hardy, and promise an abundant crop of fruit, though the season has been more than usually unfavourable ; and I have had the pleasure to observe that the best Peach is one of the most hardy.

"I entertain little doubt that the Peach-tree might, in successive generations, be so far hardened and naturalized to the climate of England and Ireland, as to succeed well as a standard in favourable situations."

[This statement is highly encouraging to the lovers of novelty, and if it lead others to follow the example, horticulture may soon boast of a rapid advance, though we make great allowance for the fondness of the raiser for the sorts of his own raising.]

THE ALPINE STRAWBERRY AS AN ANNUAL.

—The great advantage of the Alpine Strawberry is, that it can be had in perfection from July until the frost cuts it off. We have repeatedly seen them rally even after they had been cut, and gathered fruit once so late as Christmas. We did not treat it as an annual, though we raised it from seed, but we have no doubt Mr. Knight is correct in saying they ought to be so considered, so give his own words. He says :—I sowed the seeds of the best alpine variety that I had ever been able to obtain, in pots of mould, in the begin-

ning of August, the seeds of the preceding year having been preserved to that period ; and the plants these afforded were placed, in the end of March, in beds to produce fruit. This experiment succeeded tolerably well ; but I was not quite satisfied with it ; for though my plants produced an abundant autumnal crop of fruit, they began to blossom somewhat earlier than I wished, and before they were perfectly well rooted in the soil. I therefore tried the experiment of sowing some seeds of the same variety, early in the spring, in pots which I placed in a hot-bed of moderate strength in the beginning of April, and the plants thus raised were removed to the beds in which they were to remain in the open ground, as soon as they had acquired a sufficient size. They began to blossom soon after Midsummer, and to ripen their fruit towards the end of July, affording a most abundant autumnal crop of very fine fruit ; and even so late as the second week in December I have rarely seen a more abundant profusion of blossoms and immature fruit than the beds presented. The powers of life in plants thus raised, being young and energetic, operate much more powerfully than in the humours of older plants, or even in plants raised from seeds in the preceding year ; and therefore I think the Alpine Strawberry ought always to be treated as an annual plant.

[We might sow a bed every year, but we should not be in a hurry to throw away the old ones until we were convinced they were not worth growing ; for we opine that established plants will fruit earlier, and although there may be abundance of larger sorts at the time, there are none like the alpine for flavour.]

CURIOUS HABIT OF THE BANYAN TREE (*Ficus indica*).—By P. RAINIER, Esq.—In the summer of 1820, I procured some rocket cases, which were filled with equal parts of white sand and sifted loam, well mixed together, and then suspended from the tree ; into these the fibres were inserted which had shot from the different branches to the length of four or five inches ; water was occasionally applied to them till the end of October, from which time till the ensuing spring they remained dry. The bottoms of the cases were opened in the May following, and the roots soon projected ; the cases were then taken off with a sharp knife, and the operation again repeated on the extremities of the same roots, till they were long enough to touch the earth in which the tree is growing. Soon after the roots which had been enclosed were exposed to the atmospheric air, they were covered with bark, and attained the size of a quill the first year. My Banyan-tree has now thirteen stems, and is the only one I have seen in this country exhibiting its native character.

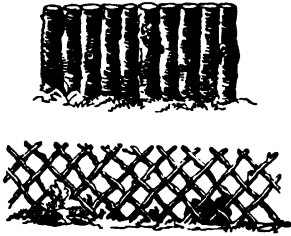


Rustic Buildings, Ornaments, and Scenery.

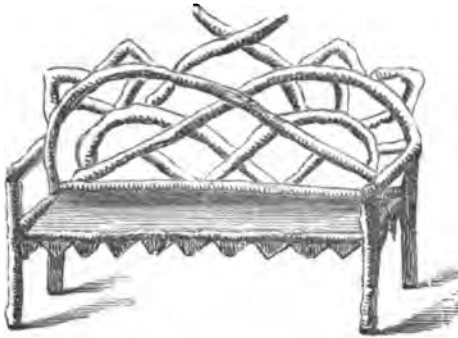
AS the acceptance of this word, *rustic*, is of more consequence than any inquiry into its literal meaning, we will merely observe, that it is intended to comprise all works really of a rural character, or in imitation of it; and if we inquire for anything rustic, we mean something in which the style, material, and the mode of putting it together, are rural, or rude—as nearly in their natural state as may be. Thus, rustic seats are made of branches or limbs of trees with the bark on. A rustic cottage would have the bark on all the wood that appeared outside, and a straw, or reed, or furze, or some other vegetable roof; all the uprights would be poles with the bark on; the sides or walls would be straw, or mud, or clay, or some other rude material. A rustic bridge would be of the same character; logs of wood across a stream, with, perhaps, some poles fastened to upright posts, to prevent any one from falling over. In fact, rustic, means the earliest efforts of man to produce conveniences with only the rudest tools, and without the assistance of those numerous advantages which are now enjoyed. Thus it would appear, that the earliest bridges, the earliest cottages in the rural districts, the earliest seats, would be of the most uncouth description, made with the smallest quantity of labour that could be devoted to produce an effect, and therefore almost all of a piece with the trees themselves. But this has, in the course of time, given rise to a

style called rustic, in which all that modern art could do to elaborate upon early notions has been done to diversify the application of the leading features, until rustic cottages have been built like small palaces, and a rustic character has been given to luxuries that rustics never heard of, much less enjoyed. Like all other elaborations, we have seen a rustic style, in some particulars, run down and destroyed by the application of the most modern and anti-rustic accompaniments; such as a rustic door-way and verandah, marble-floored hall, plate-glass windows, and a slated roof, and the whole has been called a rustic cottage. In all attempts to adopt a style of architecture, whether it be for a garden-seat or a cottage, we want consistency, that is, all that is seen at the same time should be in keeping. If we have rustic door-posts and window-frames, we do not want mahogany sashes, and plate-glass windows. However, in England, architects work for money, not for fame, and the employer's fancy is the only ruling power in general at work in the construction of everything, from a gardener's roller to a house of parliament. Orders of architecture are put into a kaleidoscope, and whatever mixture seems the most striking and pleasing to the payer, is the mixture adopted by the receiver. Rustic work, as we have before observed, has no business anywhere but in rustic scenery. There should be nothing anti-rustic even in sight. Let there be a rustic garden, but away from the

house; let everything about it be rustic: there should be nothing like mechanical nicety; even the path should not be straight. If there be necessarily a partition from some other part of the garden in sight, let it be rustic, formed of rough hewn poles, or posts, driven



into the earth, if large, upright, and close together; or if small, to cross each other, as above; but all with their bark on, and not damaged. Let every seat about the garden be a sort of aboriginal specimen of rude mechanism—blocks of wood, or seats made by



nailing branches together. The same as regards a table; let it be evidently a contrivance of rude materials, and not a piece of evidently good carpentry. There are many ways of forming tables and seats out of rough materials; a walk along the Hammersmith road



will show any one that a good deal can be done without putting a plane to wood; for there are two, if not three places, where there are collections of rustic chairs, tables, sofas, flower-stands, made of rough wood, in which all the bark is preserved. If there be a foun-

tain or a tank in a rustic garden, there should be no marble basin or terra cotta statues; there should not be an attempt at a single feature in which art can be detected; the very margin, if there must be an ornament, should be paved with blocks of wood; the very jet, if there must be an object for it to proceed from, should issue from a water-lily, or some other rural object. If there be a summer-house, or arbour, or temple, it should be rustic—the uprights, trunks of trees; the roof, straw, or furze, or reeds; the sides, thatch, or clay; and the windows, if any, the oldest of all fashions, iron frames, and lead bars, but it is far more in keeping to have no windows. The very flower-beds should be without order, though they may be clear of weeds; and the borders should be more remarkable for their imitation of nature in her wild state. The trees and shrubs should be wilderness fashion; and the only look-out should be where the cow, the rustic shed, dairy, cowhouse, and other buildings, should be in keeping. We have seen rustic seats on a lawn in front of a mansion; the milk-maid, cow, and shed, would be quite as much in keeping. "Every thing in its place, and a place for everything," is one of the most useful lessons, and it applies to nothing more forcibly than to the ornaments of a garden and grounds. A rustic seat should not be in sight of the mansion; but a whole establishment on a small scale may be got up in rustic style, if there be any object in so doing; the very entrance gate, however, must be rustic; the very fence that is next the road must be so; there can be no half doing things of this kind. In the cottage itself there must be consistency. In applying to an architect for a design for a rustic cottage, we began to explain what we meant by rustic, and we half offended the gentleman by our earnestness, when he assured us he had built many, some that cost a good deal of money. On explaining that one which had been admired was an instance of great blundering, he was all at once struck, and wanted to know why? We declined going into particulars, but merely said that rustic did not mean Gothic, nor Gothic rustic, and left him to his fancy. He produced a very pretty picture, but as completely Swiss as if that had been his order. Properly speaking, everything rural is rustic; whatever is uncultivated, unimproved, in a state of nature, is rustic; and a country clown is called a rustic; a state of nature, or as little removed from it as possible, may be well understood to mean rustic, as applied to a garden. We scarcely know anything prettier, anything more refreshing to the senses, more pleasing to the eye, than a truly rustic scene. That there should be a nook in every establishment in

which this is kept up, nobody of taste will question; all we want to impress upon the mind is, the necessity of consistency, and the folly of obtruding a bit of rustic roughness or simplicity within sight of all that is modern and refined. Suppose a lake on a lawn, and by turning one way, we see the Turkey carpet on the drawing-room floor, and on the other, the silvery bosom of the water; the eye, amidst all this, is offended by a rustic bridge. Then, again, if the lawn is carpeted with little beds of roses and all the modern annuals, a rustic seat, or a rustic basket, or some other rustic absurdity, is placed under one's nose, to show how ridiculous it is possible to make a place look by the obtrusion of some incongruity upon the scene. The labours of some gardeners, and the fancies of some employers, seem to be devoted to the impossible object of cramming all the best features of nature into their limited space, and they manage to make every one ridiculous by its diminutive proportions, and the whole surpassingly absurd by presenting all the half-developed follies to the eye at once. Fish-ponds that a dozen of ducks would crowd to inconvenience; canals that a respectable London puddle after a shower of rain would make look diminutive; bridges about the size and style of a boy's rocking-horse turned wrong way upwards; summer-houses that look as if the children had left one of their doll's houses about the place; rock-work, as if the gardener had forgotten to remove the stones he had raked off the beds; and as to rustic work, the best use they can make of that is, to construct baskets, to be filled with stove exotics in the conservatory, with geraniums in the hall, as if to present as great a contrast as possible, by showing the simplicity of our forefathers in their rustic contrivances, with the enterprise and luxuries of the present day. The drawing-room coal-scuttle filled with water and gold-fish would be quite as much in place, and, to thinking people, not a wit more ridiculous. When people, therefore, object to rustic work, the first question to put to them is, where did they see it? because, if a man has seen it out of its place, he may be excused for condemning it, although the same party, seeing it in its proper place, may approve of it as much as he has objected to it before. We do not wonder at the objections; what we really do wonder at is, that people do not, one and all, condemn it, through the miserable cockneyisms committed with it daily. However, the misapplication of anything ought not to be a reason for condemning it; there is nothing more beautiful than rustic scenery, and this can only be made complete with rustic work. Its application may be permitted properly—

First, in any portion of the grounds sufficiently out of the general scenery, and unconnected with the general features, to prevent anything anti-rustic from interrupting the feature; for instance, at a distance from



the mansion, and the scenery connected with it, and in some measure isolated; a nook, out of and away from the entrance road, and commanding a rural prospect unconnected with all the dressed part of the ground. In such



a place there might be a rustic summer-house, or even only a rustic seat; or, if large enough, a complete rustic scene—a cottage, with the appurtenances of a low cow-house, pig, and proper sty; a summer-house, far enough re-

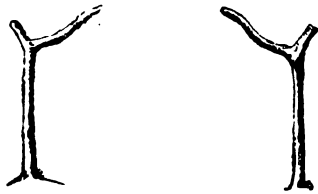


moved to be out of the way of the inmates; a stile instead of a gate, to mark any outlet from the place for the cottagers; the place to partake more of the wilderness form than that of a garden. But our business is with the

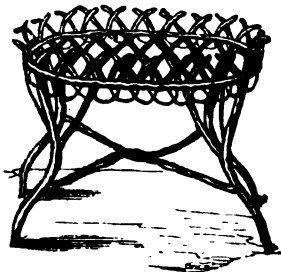
rustic buildings, and seats, stiles, and other contrivances to keep up consistency. The cottage, which should be a lodge for one of the gardeners or husbandmen, should be built in imitation of the rudest style, and, so far as appears outwardly, with the rudest materials.



There should be nothing like finished carpentry in sight. However substantial and comfortable it may be made, (and the more so, the better,) appearances should be kept up connected with the intended scene. The most rough, half-built, and tumbling down looking



cottage that can be found in the most neglected village may be taken for a model, if it be but picturesque. The more roughly every out-building is constructed to all appearance, the better; and all things should be to match. The garden, or rather the bit of ground appa-



rently belonging to the cottage, should be without any definite form; it should altogether appear as much like one of the mud cottages built on the side of the forest, on ground stolen a bit at a time, and increased by continual encroachments, as anything. Every-

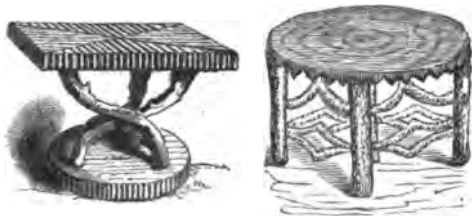
thing like a fence against pig, cow, or horse, ought to be with whole wood, not chopped or formed, but picked out as near to the form as it could be had. Thus, everything will match, so far as the natural scene, for such it may be called, is concerned. You now want the ornamental part to be completed without doing violence to the rest; a rustic garden, apparently belonging to the cottage, but, in reality, forbidden ground. Here we want the rustic summer-house, rustic seats, rustic contrivances for holding flowers, rustic tables, and sundry other ornamental and useful matters, to appear like rough contrivances, although requiring infinitely more pains than regular carpenter's work. The only allowable licence to depart from the rudest and crudest forms, is that of rendering the objects uniform, where such would add much to the effect; but this uniformity may be just as near as nature will supply you, or perfect, whichever pleases the taste the best. As the matter of mere upright and strong growth may be considered sufficient for some people's idea, there may be uniformity enough without stepping out of the way, but where elbows and bends are required, and *outré* forms are indulged in, it can only be accomplished properly by splitting each one into two, by sawing the piece completely through the middle, which gives us two of the same figure, the one right-handed, the other left; a pole, with one spreading fork, almost like a direction-post, may serve for the right and left of a door-way, if we could not get one the exact match for it to face it, by sawing this completely through the middle; thus we make two half-thicknesses exactly alike, and by putting them opposite each other, or back to back, we make a complete figure. Here, then, the means of carrying out any object whatever with complete uniformity, by splitting those pieces which, from their peculiar form, are adapted for any particular object. For a rustic garden seat there must be a good front, and there is no very great necessity to have two to match; but where we do get hold of a fine piece adapted for a front, we ought to prize it, and make two. We have given abundant evidence of the advantage of thus duplicating anything. In the upright supports of a roof, the advantage is great, and by way of forming entrances, some of the accidental growths, when duplicated thus, give instances of what may be fairly called architectural beauty; and be it remembered, that the most uncouth looking log, that seems hardly fit for anything, may, by means of merely finding its double, become a very useful door-post, or house-prop; for its incongruities when duplicated become orderly, uniform, and well balanced. It is almost im-

possible to find a piece of rough wood that may not be brought in and used. The best mode of constructing a rustic summer-house, is first to find a piece of rough wood so formed as to do for one side as a door-way, a sort of main front support. Split this into two, and each will have a flat side to go up against anything pretty close, and a front with the bark on. The numerous cuts which are annexed will show some of the many odd forms, that when split will be appropriate: by adopting this practice throughout, one side of the summer-house may be the same as the other, that is to say, uniform. Make up your mind as to the size you intend to build, and then get the frame of your place roughly made by a carpenter; a mere shell, as strong as may be necessary, and as rough as you please; by this you get rid of all responsibility as to the strength. This done, place your own rustic materials so that they fasten well to the wood-work already there, and form the striking feature; your own taste must furnish the best looking pieces of wood, and whatever does for one side of a door, will do for another; whatever fills up a nook on one side of the house, will do the same for the other; there will be a perfect uniformity, with only just the natural difference between one side of a branch and the other, a difference that gives a better effect than if they were mechanically accurate; for the outline is sure to be the same, one must fit one side as well as the other fits the other side. There must not be an inch of the wood-work inside to be seen, every bit must be covered; but there is no difficulty in this. The inside may be lined with reeds, or straw, preserving all the character of a make-shift, and securing a warmth equal to any other, and superior to most other linings; the straw should be close and thick, hiding all the frame-work, and showing through the rustic wood-work outside, but making a complete finish. With regard to rustic seats, there may be infinite variety; a common three-legged stool may be made with a slice of a tree for the seat, and the bark left on the edges. This slice should not be too thin. Then a framed sofa may be made, and the seat formed with split wood with the bark on, nailed close side by side; thus, suppose Fig. 1 to be the bottom, or seat, made for the covering, Fig. 2 shows it with the pieces nailed on almost to the end. The front of a garden seat may be a mere pole cut the proper length, and upright stumps for legs; but it is far better to find a limb of a tree, with branches that can be shortened for legs; or if not, to find an appropriate looking piece to make a good-looking front, and frame the other into it. There are many of these to be found, and if one is procured rather curious, or good,

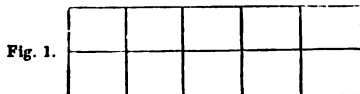
split it, and make it into two—one a right-hand, and one a left-hand seat. Examples of this may be often found among garden sofas. The most ordinary capacity is enabled, from these, to understand precisely what we would direct, and among the diagrams of duplicated subjects will be found examples of the most common and easiest procured forms of branches becoming, by the mere act of duplicating,



that is, splitting up, the most ornamental and striking objects. In all rustic scenery, the entrances to alcoves, to shady nooks, to narrow shady paths, and other similar avenues or openings, should always be formed with such in preference to any other kind of embellishment, and because nothing is so easy as to make both sides match. However, leaving



the construction of these purely rustic matters, and all belonging to them, to the explanation afforded by the numerous diagrams and sketches, we now proceed to the second feature of our subject, which is, Rustic Facings, Rustic Surfaces, Rustic Ornaments, a completely fanciful application of a rustic feature to the most modern and civilized taste. We are not



now defending the propriety, but showing the mode of displaying a very questionable taste.

Everything formed of wood with the bark on is now called rustic, and there never were so many devices of this kind as in the present day. They are as numerous as the devices for inlaying, or Mosaic, although carried out

with such different material. Whatever form be framed in wood, it can be covered with a rustic facing, and where the style is supposed to be taken from the rudest and most uncultivated people, the finish shows no little ingenuity; the only rustic part of the affair is splitting branches of wood with the bark on,



just as the coopers split branches to make hoops of, and then disposing of them in lengths, to form whatever pattern is required on the surface to be covered. If it be a table, the edge is the first thing to be looked after. This may be done with a good many pieces



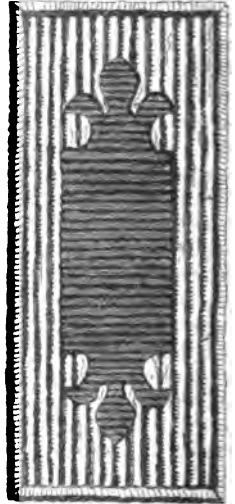
fastened across the edge, or one or more lengths fastened longways round it. In either case there ought to be from a third to a half-inch ledge formed above the plane of the table, and something below to give an appearance of thickness to the edge; and where



there are pieces to join lengthways, there must be some nicety in the fitting of end to end. The centre of the table, or flat part, may be done a hundred ways; the pieces may radiate from the centre, or be laid down in chequers, or many different ways, according to the design of the artist. The various

accompanying subjects and plans of covering will give an idea of the effect, but the work is as simple as need be. The plan has to be sketched, and then we may judge in what way the pattern can be best worked out with straight pieces of wood. They are easiest managed when the figure will bear many pieces of the same length. As in cases of chequers, suppose a piece of plain surface has only to be covered by three-inch squares, all the wood has to be made three-inch lengths; but any figure can be met, for instance, the following top of a table:

—The pieces to form the figure have to be cut of various lengths, but in some patterns they may be made to do without any of the rounding, or adjusting the end, as in this case. Under all this rustic work there is nothing but a plain board; but the frames and legs have also to be hidden, unless they are made of wood with the bark on, which is the best way, if not the easiest. For instance, let us look at a table-frame made with the rough wood



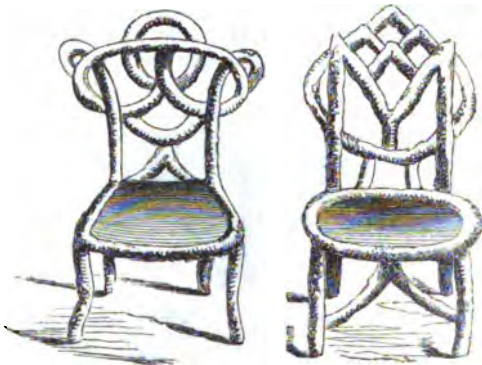
only. This is supposed to be made with a slice of a good thick tree, with the natural bark on the edge, and then bent branches crossing each other underneath, to form a standing for it, after the fashion of a pillar and claw table; the top of this table is plain as the saw leaves it, unless you like to plane it and smooth it a bit. If such a piece were formed of a slice near the butt of a walnut-tree, it would polish as handsomely as mahogany. If, however, the frame is made plain, and has to be covered, it must be a square frame, and then mere slabs, as they are called, will do to cover. Slabs are the outside cuts of trees that they are squaring, and contain very little besides the bark. These, however, can be cut to cover almost anything. We need hardly say that in the small work of this kind there is a good deal of niggling labour; all the pieces have to be cut with a fine saw, all have to be adjusted with a nice hand, and all have to be fitted into their places with great exactness. The legs of chairs, seats, and tables, ought on no account to be cased if it can be helped; they had better be straight poles with the bark on, than be in anywise pieced, because they are sure to get damaged by the feet. It is better to compose the frame at once with rough

wood, put the top on plain, and then garnish it with strips of wood with the bark on, in any design you please. Boxes, flower baskets, flower-vases, and flower-stands, are produced in the greatest variety, and all by the same means; form them plain and rough, and cover them as you please. Nobody dreams about nature in this branch of rustic work; it is simply adopting the bark of trees as the most pleasing ornament for the outside, or the apparent material of anything, instead of relying on paint, or inlaid work, or ormolu, or any other fancy; and as such, we have only two or three rules to lay down. The one is, to well dry all the split wood intended to be cut up, before you attempt to cut it into lengths, or you would find, in drying, it would greatly shrink. After it is cut into lengths, keep it dry, or it would swell, and your work when done would not be accurate, because it would shrink again and leave vacancies. Take care that all your wood for the same ground is the same thickness, for one piece may not stand higher than another. Cut with a very thin saw, that the cut may be clean, and so contrive your working-bench as to have a slit piece of wood through which your saw shall work, and a stop to which your wood shall be thrust home while you saw it, so that there shall not be the smallest difference in those intended to be of a length. In splitting a quantity of wood, there will, of course, be a good deal too thin, or too thick. Those will do for any chairs, tables, sofas, and many similar subjects, or rather, subjects for similar purposes; the entire frame-work should be formed of the rough wood, whole or split, as the case may be. If whole, the article is necessarily dependent on the kind of wood you can best get hold of; and the more it is bent about naturally, the more ingenuity may be exercised in forming it; but if the object be formed with split wood, all the parts may be made uniform. It is necessary that all wood to be split should lay flat one way, whatever bends or branches there may be any other way, as it could then be sawed through, and form two pieces exactly the same, and so make a uniform pair to be used in any way; but suppose a piece bends part one way, and then turns out angularly, or otherwise, so as not to lay flat any way, it cannot be useful split; and the best way is, to bring it into use in forming a seat or some other subject with the entire wood. But as the work formed on flat boards by splitting small wood affords the greatest scope for fancy, and the covering is almost a lady's amusement, not unlike the fancy work-boxes which they ornament with the pith of rushes, we shall offer a few more remarks on that kind of covering. A carpenter may be set

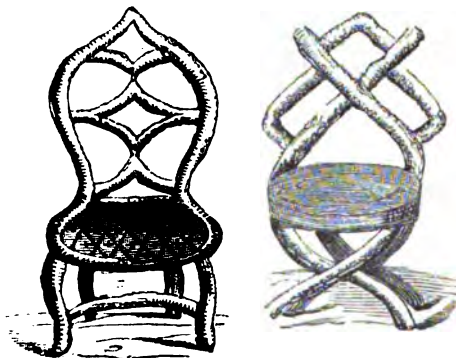
to work to form a table, leaving a square flat surface for the purpose of being covered; these tables should have a good framed edge, wide enough to be worth covering with short



bits of wood, which will give the table an appearance of solidity. There should not be any mixture of the style. Let the table that is to be covered with these split sticks, be



adapted for covering all over, as it is a fancy thing, as completely as Mosaic work could be; let there be no inconsistency, for it is, after all that can be said or done, a kind of work to

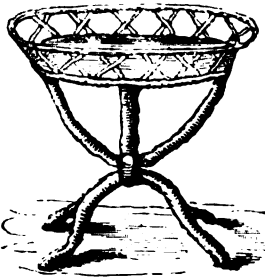


be used alone. You may always, at leisure, be splitting the wood whenever there is enough of it, for, although it may not be wanted at the moment, it will do in the end for some-

thing or other. With regard to the disposition of the straight lines, for such are the only lines which we produce in anything with straight sticks, it is easy to make a Grecian

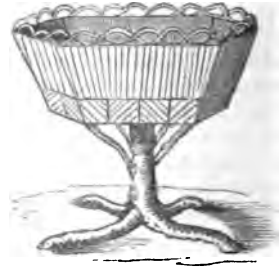


border, or any other fancy pattern, by first drawing it on the table, then making your pieces the right length to form the figure, which figure may be designed completely after your own fancy, and to answer best for the materials you have to work it with. Every square in a table may be diversified, if variety be the object; but we are no advocates for departing more than is necessary from the simplicity which may be preserved even in these departures from the true rustic. If a person were bent on such a task, a rough



built hut or hovel might be cased over every bit of wood-work. The very sashes, as well as window-frames, might be covered with

unbarked wood; the door might be panelled with this fancy rustic, but it would not be natural. We think all natural scenery should have the real thing, or as near to it as possible; when we break out into these fancy matters, we may indulge in all sorts of whims and oddities; for they may as well be a good deal unnatural as a little unnatural. The more fanciful they are, the more curious, and therefore to the curious the more gratifying they are. With the abundance of wood engravings exemplifying the forms and applications already known, there will be no difficulty in setting to work. It is, in some cases, a work



not too hard for ladies, and peculiarly adapted to their tastes. Very little assistance is required, and a jobbing carpenter, under the direction of our fair enthusiasts, will soon accomplish any task they are likely to have imposed on them. There are many different kinds of wood applicable to these matters; the only thing to take care of is, that it shall split easily, and retain its bark pretty well; and there is no danger of this, if done at a proper season, the autumn of the year, when the leaves are all off, when the pruning season is on, and when it matters very little whether a tree is robbed more or less of a few of its branches.



SKETCH OF THE VEGETATION OF CALIFORNIA.

We know something of the nature of the Californian vegetation from the labours of Douglas and other travellers. Many of the finer of the hardy plants which have been introduced to our gardens within the last twenty years have come from this source, and have reached us chiefly through the instrumentality of the Horticultural Society of London. The finest of the annual plants which are now most generally cultivated, are Californian; many of our fine hardy shrubs are Californian; numerous bulbous plants grown in our gar-

dens, among them one genus of great beauty, which has hitherto defied all the attempts that have been made to cultivate it—we allude to the *Calochortus*—are Californian; and several of the fashionable forest pines are also Californian. This experience of the productions of California induced the Horticultural Society to despatch one of their most successful collectors in search of fresh objects of cultivation; and now that his mission is ended, and his journal completed, we shall select such portions as convey interesting information re-

specting the plants of that division of the New World. The collector sent out was Mr. Hartweg, who had already obtained many fine plants from Mexico, and the details of his journey are published in several parts, in the *Journal of the Horticultural Society*, from which source we make the following extracts:—

“After a passage of forty-five days in one of the Royal Mail Steam-packets, I arrived in the evening of the 13th of November, 1845, in the roadstead of Vera Cruz, and landed the following morning, when I presented my letters of introduction, and made arrangements with Messrs. Manning, Mackintosh and Co., with regard to forwarding the collections I might from time to time send to their care. On the 15th I left Vera Cruz for the sugar estate of Mirador, where I was welcomed by my old friend, Mr. Sartorius. Mirador is about three miles from Zacuapan, where Mr. Sartorius then resided when I arrived in Mexico in December, 1836; and being situated on the eastern declivity of Orizaba, commands a fine view of the lowlands of Vera Cruz. Having only a short time to spend here, I made an excursion to the colder district of Orizaba, by passing through a deep ravine to the village of Chichiquila. Here I found a *Magnolia*, forming a large tree with oblong shining leaves, several species of oaks, *Garrya macrophylla*, *Cobæa scandens*, *Lophospermum scandens*, two species of *Viburnum*, a *Cornus*, *Tilia mexicana*, a *Juniper* forming a small tree, *Pinus Pseudo-strobus*, and *P. Llaveana*, the latter with rather more elongated cones than those found near Zimapan.

“On the 29th of November, I arrived at Jalapa, and taking the diligence for Mexico, I arrived in the capital on the 3d of December. After a stay of two days, during which time I delivered my letters of introduction, I left for the Hacienda de Laureles, near Anganguco, where seven years previously I found *Achimenes patens* and *heterophylla*, the objects of this journey. Notwithstanding I recollected the locality where I saw them in flower in September, 1838, yet I had great difficulty in finding the roots, for not a leaf, however shrivelled up, could be seen. Under these circumstances I consider myself very fortunate in having found roots of some species of *Achimenes*, but whether of *A. patens* or *heterophylla*, or both, I must leave undecided. [It has proved to be *A. patens* only.]

“On the 13th I returned to Mexico; on the 15th I was obliged to be present in clearing my luggage at the custom-house. On the 16th I went in search of *Abies hirtella*, of which Humboldt gives the locality at ‘El

Guarda,’ an insignificant military post on the road to Cuernavaca, at a distance of thirty miles from the capital. El Guarda is situated on a lofty plain; the only silver firs within view are on the mountain half a mile to the south; this is a little wood covering only the north side of the hill, and consists entirely of *Abies religiosa*. From inquiries I made at El Guarda respecting another silver fir growing about there, I could learn nothing satisfactory. From my own experience I am sure that it does not grow, if at all, within six miles of El Guarda. This excursion, however, has not been fruitless, for I found near Ajusco a Pine I had never seen before, and which I suspect to be Loudon’s *Pinus Montezumæ*; it has the same glaucous appearance as *P. Montezumæ* in the Society’s Garden, but shorter leaves, smaller and more pointed cones. It forms a tree of about forty feet high, and from the upright leaves and habit in general, it has much the appearance of *Pinus Pineæ*.

“On the 17th I returned to Mexico, and called the following day upon H. B. M.’s Minister, Mr. Bankhead, through whose influence I obtained some letters of introduction from the Mexican government to the governors of Guadalajara, Mazatlan, and California. Having arranged my affairs with Messrs. Manning and Mackintosh, I took the diligence on the 19th for Guadalajara, where I arrived safely on the 25th, passing over a very uninteresting ground, for not a tree was to be seen, save a few stunted *Schinus molle* and *Opuntias*.

“On the 28th I left on horseback, and arrived in Tepic on the 1st of January, 1846, after five days’ hard riding. The town of Tepic is situate in a plain at an elevation of nearly 3,000 feet above the level of the sea, and enjoys a temperature of eighty degrees in summer, and sixty to seventy degrees during the winter months. Most tropical fruits and sugar-cane are cultivated here. In the S.W., at a short distance from the town, is a range of mountains, of which the highest part is called the Cerro de San Juan. The whole range is of volcanic origin, and is chiefly composed of crumbled pumice-stone, which at a distance gives it a whitish appearance. The principal forest-trees are Pines, one of which closely resembles *P. macrophylla*, with beautiful long foliage, and cones varying from twelve to sixteen inches in length. This forms a tree from sixty to eighty feet high. Another species of Pine, forming an equally large tree, is called by the natives *Ocote hembra* (female pine, in opposition to the first, which is named *Ocote macho*, or male pine). The foliage of this new species is sixteen inches long, and the cones measure from four to five inches in length. This is not frequently met with, and the cones

are produced more sparingly than in the other kind. The more elevated parts of the Cerro de San Juan are covered with oaks, an *Arbutus*, a shrubby *Bocconia*, several syngeneious shrubs, a white flowering *Ceanothus*, *Bouvardia splendens*, and among herbaceous plants I observed *Lobelia laxiflora*, *Spigelia scabriuacula*, with a head of crimson flowers resembling at a distance *Phlox Drummondii*, a half shrubby *Pentstemon* with large pink flowers, *Macromeria exserta*, *Aristolochia brevipes*, and the showy *Lamourouxia multifida* and *cordata*.

"On January the 8th, passing over the plain of Tepic in an easterly direction, after a ride of six hours I entered the Monte de los Cuartos, a forest consisting chiefly of oaks with a few pines intermixed: the only plant in flower was *Lupinus Ehrenbergii*; on the banks and in the dried-up bed of the rivulet that crosses the mountain, *Littæa geminiflora*, with a flower-stem from twelve to eighteen feet long, but bent down by the weight of its numerous seedpods, grows abundantly. In the evening I arrived at the village of Ocotello. About noon the following day I reached the hamlet of Ausetá, situate at the foot of the volcano Tetitlan. Having with difficulty procured a guide to ascend the mountain, and provided the necessaries, including a calabash with water, we set out and arrived before sunset on the north-western declivity of the volcano, where we encamped for the night in a beautiful pine forest. At seven o'clock on the 10th, leaving our horses in charge of my servant, I began to ascend with the guide, who, being armed with a machete (a kind of long knife), cleared a path among the brushwood and long grass that encumbered our way. After a continual steep ascent of four hours, through a forest composed of that long-coned pine found near Tepic, a few oaks, *Mimosas*, a *Laurus*, *Garrya laurifolia*, and a *Fraxinus*, we arrived at the ledge of a black volcanic mass, destitute of all vegetation. No crater is perceptible, but it seems that the torrents of partly calcined lava that descend several miles into the plain below on the north and south side of the mountain, burst forth laterally. The volcano of Tetitlan is about 6,000 feet above the level of the sea; centuries must have elapsed since it was in activity; no tradition exists among the population settled at its base when it broke out. Having finished our survey, we returned to our encampment in two hours, and in the evening reached the farm of La Estancia, and returned thence by way of San Pedro to Tepic on the 12th.

"On the 20th I had crossed the plain of Tepic in a southerly direction, leaving the Cerro de San Juan on the right. After an easy ride of three hours, we entered a ravine

through which a stream that we had to pass several times winds its way. The vegetation here assumes a tropical character, and furnished me a *Cattleya*, *Stanhopea*, *Mormodes*, *Catasetum*, and an *Epidendrum*, none of them however in flower. In the evening we arrived at Compostella, said to be the oldest town in the state of Jalisco: judging from its dilapidated state, tradition seems to be correct. On the subsequent day, crossing the plain of the Hacienda de San José del Conde, which affords rich pasture to several hundred head of cattle, we descended to the river of Huitotillan, a mountain stream running in a ravine probably 800 to 1,000 feet lower than the level of the plain. The perpendicular sides present no facilities for a road being made there, we therefore had to pass up the ravine, fording the river eight times, which owing to the late rains was nearly impracticable, as the water reached up to our middles. The vegetation, as far as the small village of Matanejo, where we arrived in the evening, affords little interest at this season. The copsewood covering the sides of the ravines is composed of deciduous leafless shrubs, only relieved by a giant *Cereus*, forming a singular tree; this generally has a single stem two to four feet high, by eighteen inches in diameter, when it divides into numerous triangular branches, rising perpendicularly to the height of twenty to thirty feet. In May it yields a delicious fruit called *Pitaya*, when it is much sought after by the natives.

"Leaving Matanejo early the following morning, we soon entered a forest of oaks; here I found two species of *Epidendrum*, an *Oncidium*, *Odontoglossum*, and an *Epiphyllum*, the latter, like *E. Ackermanni*, inhabiting trees. Although I have not seen it in flower, yet judging from its broad deeply-cut leaves, or rather stems, it will prove a valuable acquisition to that interesting tribe of plants. The timber of the oak does not bear a high character as to durability; when exposed to the weather it soon rots, and the trees, however healthy they appear to be, are generally hollow in the centre.

"Not seeing any prospect of finding anything to warrant my proceeding further in this direction, I returned to Tepic on the 25th. The following day the *Aguas nieves* set in again, and continued up to the 29th with scarcely any interruption. Having made some excursions in the immediate vicinity of Tepic when the weather permitted it, but without finding anything worth noticing, I set out again on the 7th of February for San Blas. Descending by the road usually travelled during the dry season, we arrived in the evening at the farm of La Manuela, situate in a wood of *Acacias*, *Prosopis*, *Laurus*,

Palms, Cedar, the Lemon, a species of Citrus, and several species of Ficus, among which there is one sending forth roots which descend into the earth, giving support and nourishment to the numerous far-spreading branches, or sometimes encircling a palm with its stem, thus presenting the singular deception of palm-leaves growing out of the fig-tree. As may be supposed, the embrace in time proves fatal to the palm. A species of *Annona* also occurs here spontaneously, producing a fruit which in size and shape resembles the Cherimoyer, but bears no comparison with the latter as to quality. I often saw it cultivated in the warmer parts of Mexico, requiring a higher temperature than the Cherimoyer. It is, I believe, *Annona lævigata* (?); the native name is Anona.

"From La Manuela to San Blas, where we arrived the following day, the country is perfectly level, subject to inundations from the Rio Grande de Santiago, which empties itself by many outlets into the sea a few leagues above San Blas. One of these inundations happened a few days before, and left us to traverse a space of five leagues knee-deep in mud. After a stroll upon the beach and amongst the salt marshes, covered with *Rhizophoras*, which surround the town, I soon convinced myself that I need not look for any novelties there. Being detained on the 8th by the incessant rain, I returned to Tepic on the following day by the 'Camino de aguas'; this road is considerably shorter than the one I came, and from its rocky nature is passable at all times, whilst the road by La Manuela is several feet under water during the rainy season.

"The following observations of the amount of rain fallen in Tepic from June 1845, to March 1846, were made by Mr. Alexander Forbes, and have been kindly given me by that gentleman:—

	Inches.
1845. June . . .	6·5
July . . .	12·8
August . . .	9·5
September . . .	11·6
October . . .	1·6
November . . .	5·
December . . .	1·
1846. January . . .	3·8
February . . .	2·3
Total	48·1

"This amount of 48·1 inches fallen during nine months is, however, above the average in ordinary seasons. The periodical rains set in about the middle of June, and terminate by the end of September; the rest of the year is usually dry."*

"On the 23d of February I returned from an excursion to the Rio Grande de Santiago, the largest stream in Central Mexico, taking its rise from the swampy plains between Lerma and Toluca, near the city of Mexico, and traversing a space of more than 600 miles in a north-westerly direction. During the late rains the water rose fourteen feet above its ordinary level, destroying the early crops of Indian corn, and carrying everything before it that impeded its course. The vegetation is in no respect different from that observed on the descent to San Blas; and the only objects derived from this excursion were an *Epidendrum*, an *Oncidium*, and another orchidaceous plant resembling a *Catasetum* in habit, but producing a flower-stem eight to ten inches from the apex of the pseudo-bulbs, which at its extremity is much branched. This species occurs exclusively on palms, and seems to flower during the rainy season.

"On the 7th of March I despatched a tin case containing the seeds collected about Tepic to Guadalajara, to be forwarded thence by diligence to Vera Cruz. On the 9th I sent off to Tampico the Orchids and pine cones, occupying two chests. About the same time my luggage arrived from the city of Mexico, where it had been detained a month from the want of an opportunity, and the change of government, which took place about the beginning of the year. On the 14th of March, I finally left Tepic for San Blas, whither my luggage had preceded me, and embarked the following day on board of a small schooner for Mazatlan, where I arrived after a passage of five days. Mazatlan is now the most important port on the west coast of Mexico, as the custom-house officers are more accommodating than at San Blas or Acapulco. I left Mazatlan on the 11th of May, and arrived at Monterey on the 7th of June, after a passage of twenty-six days.

"The verdant fields and pine-covered range of mountains at the back of the town form a pleasing contrast to the dried-up vegetation about Mazatlan. The predominating trees are an evergreen oak (*Quercus californica*), forming a tree thirty feet high, with a globular crown, and having the branches much distorted. It occurs principally in low but dry situations. The higher parts are occupied by *Pinus insignis*, a tree sixty to 100 feet high, with a stem of two to four feet in diameter. This species is liable to vary much in the size of the leaves (which stand in threes) and in the cones, according to local circumstances. In close woods, a mile or two from the sea-shore, at an elevation of 200 to 300 feet, the leaves usually measure four-and-a-half to five-and-a-half inches, and cones four to four-and-a-half inches in length by

* Vol. i. part iii. pp. 180—185.

two-and-a-half broad; towards the beach, where the trees are mostly one-sided—a defect caused by north-west winds, which blow for the greater part of the year—both leaves and cones diminish in size. These differences, which are too insignificant to establish even varieties of *Pinus insignis*, have given rise to the names *Pinus tuberculata* and *radiata*, which were, according to Loudon, collected by the late Dr. Coulter near the sea-shore at Monterey; that locality, no doubt, is Point Pinos, as it is the only habitat near Monterey where pines grow close to the beach; it is at the same time the place where I made the foregoing observations. In all situations the cones grow three or four together in a cluster, remaining on the trees several years after shedding the seeds; are pendulous, with the apex somewhat recurved; deformed, that is, the scales on one side are more developed than on the other, and enclose two winged seeds under each scale. The cones are about eighteen to twenty-four months in ripening.

“On the dry banks of ravines, to the north-east of the town, the Californian horse-chestnut (*Pavia californica*), is common. This extremely ornamental shrub or low tree rises to the height of twenty-five feet, is of a globular shape, and produces its fragrant whitish flowers of a delicate pink hue in great abundance on spikes twelve inches long; one of these spikes, which I had the curiosity to count, had more than 400 open flowers and buds upon it. Of shrubs I observed *Ceanothus thyrsiflorus* very common in the pine-woods, and forming an evergreen shrub ten to fifteen feet high; a *Sambucus*, *Lonicera racemosa*, *Spiræa arizæfolia*, *Rhus*, 3 sp., *Caprifolium Douglasii*, a *Diplacus*, *Garrya elliptica*, a *Rosa*, *Lupinus arboreus* and *ornatus*; *Ribes speciosum* and *malvaceum*; *Adenostoma fasciculata*, a neat little evergreen shrub allied to *Spiræa*; *Arctostaphylos*, 3 sp., a *Vaccinium*, *Gaultheria Shallon*, an evergreen *Prunus* resembling the Portugal Laurel. Of annuals and perennials, a *Hugelia*, *Delphinium*, 3 sp., *Leptosiphon androsaceus* and *densiflorus*; *Collinsia bicolor*, a *Convolvulus*, a *Malva*, *Lupinus succulentus* and *densiflorus*; a *Castilleja*, an *Oenothera*, a *Chironia*. Of bulbs, *Calochortus luteus*, *Cyclobothra alba*, *Brodiaea congesta*, *Calliprora flava*, *Hesperocordum lacteum*, and a *Zygadenus* called *Amole*, of which the bruised roots serve as a substitute for soap.

“On June the 22d I left Monterey for the mission of Santa Cruz. Santa Cruz is across the bay, due north, of Monterey, and at a distance of sixty miles by land, whilst by water it does not exceed twenty-five miles. Passing along the sea-shore over the plains, which present the same vegetation as about

Monterey, we arrived in the afternoon at the mission, after a gallop of seven hours. The mountains of Santa Cruz are well wooded with *Taxodium sempervirens*, called by the American settlers redwood or bastard cedar. In close forests it grows to an enormous size, averaging 200 feet in height, with a stem of six to eight feet in diameter, which is as straight as an arrow, and clear of branches up to sixty or seventy feet. One tree, that is termed by the Americans ‘the giant of the forest,’ is 270 feet high, with a stem measuring fifty-five feet in circumference at six feet from the ground. The bark of the redwood is from six to twelve inches thick, reddish and smooth; the timber is of a beautiful red colour, like pencil wood, fine, close-grained, light, but brittle; it is well adapted for in and out-door work, as the boards when seasoned do not warp, nor is it attacked by insects. Large quantities of timber are annually exported to the Sandwich Islands; 1,000 feet of one-inch boards, delivered on the beach at Santa Cruz, are worth 8*l*. Some fine trees of *Abies Douglasii* are found in the mountains of Santa Cruz; they do not form masses of themselves, but are thinly scattered among the redwood trees, with which they vie in size. The mountain oak (*Castanea chrysophylla*?) also occurs here, forming a tree fifty feet high; of a pyramidal shape, with persistent lanceolate leaves four inches long, serrulate on the margin; below they are covered with a rusty, yellowish down, which in the young leaves also covers the upper surface. The fructiferous catkins are produced on the points of last year’s wood, and do not exceed two inches in length, whilst the catkins on the young wood are from four to five inches long, and sterile. The nuts, or rather acorns, are covered, in an unripe state, with down, and enclosed in an open cup, which on the outside is clothed with coarse scaly hairs. The mountain oak grows invariably in close shaded woods, and seems to be widely dispersed over the country west of the Rocky Mountains. Some Indian tribes eat the acorns either raw, or make a sort of bread of them. On the outskirts of the woods I observed *Arbutus procera* fifty feet high; a Lauraceous tree with linear light-green leaves of nearly the same dimensions; two species of *Ceanothus*; a *Corylus*, a *Spiræa*, a *Solanum*, and *Zauschneria*, the latter with scarlet flowers like a *Fuchsia*.”*

“On July the 2d I returned to Monterey. The few days of absence produced a great change even in the vegetation; the fields and woods, which before were covered with flowers, are now gradually drying up, from the total

* Vol. ii. part ii. pp. 121—125.

absence of rain during the summer months ; even the bulbous plants had, during that time, shed their flowers and ripened their seeds. Crossing the wooded heights near Monterey, I arrived at Carmel Bay, after an easy walk of two hours ; here I found a *Diervilla*, *Cupressus macrocarpa*, attaining the height of sixty feet, and a stem of nine feet in circumference, with far-spreading branches, flat at the top, like a full-grown cedar of Lebanon, which it closely resembles at a distance ; *Eschscholtzia crocea*, *E. californica*, *Platystemon californicum*, a scarlet *Castilleja*, a *Mesembryanthemum*, resembling *M. rubrocinetum* ; a *Cheiranthus*, *Stenactis speciosa*, an *Echeveria*, *Abronia rosea*, and *A. mellifera*. These two species, the former with pink, and the latter with orange flowers, are spreading on the sands near the sea shore, and delightfully scent the air with their perfume towards evening.

"Another excursion, which I made to the Rancho de Tularcitos, led over the mission of Carmel. Following up the narrow valley of the Carmel river, I entered a beautiful wood of alders, willows, and plane-trees, some of the latter attaining the height of eighty feet, and twelve in circumference. Of herbaceous plants, I observed two species of *Solidago*, *Mimulus cardinalis*, a Labiate plant, an *Asclepias*, an annual, with an extremely powerful smell, which, if inhaled in excess, produces bleeding at the nose. Of shrubs, a half-climbing *Caprifolium*, with small dingy flowers ; a *Clematis*, a species of *Cercocarpus*, and on rocky ground, a patch of *Berberis Aquifolium*. The sides of the mountains, which attain no great elevation, are thinly covered with oaks. The higher parts, near the Rancho de Tularcitos, are occupied by *Pinus macrocarpa*, which rise to the height of eighty to a hundred feet, with a stem of six to eight feet in circumference. The larger trees had not yet ripened their cones, but the smaller ones, of twenty to thirty years' growth, ripen theirs at different periods, and furnished me with a few cones. On my return thence, over El Toro, a high mountain, destitute of trees or shrubs, but thickly covered with wild oats (*Avenæ* species), I found, on the north side, in a ravine, a few small trees of *Pinus Sabiniana*, the highest of them not exceeding thirty feet. In this situation they appear to produce their cones when yet very young. Some trees, measuring from eight to ten feet in height, and of as many years' growth, had cones on them, which, like the foregoing species, seem to ripen about November.

"On August the 23d, I embarked on board the bark Joven Guipuzcoana, whose owner, Don José Antonio Aguirre, invited me to take a trip with him up to the Bay of San Francisco. On the following day we anchored off Santa

Cruz, where the ship was to remain a day or two. I took advantage of this delay, and made an excursion to the mountains, in a different direction from that visited before. Passing through a copse wood, composed chiefly of *Pavia californica*, *Quercus californica*, *Ceanothus thyrsiflorus*, a *Corylus*, *Rhus viride*, called Yedra, and justly dreaded by the inhabitants for its poisonous properties, I entered a beautiful pine-wood. The leaves of this species of pine stand in threes ; are longer than the cones, usually eleven inches in length ; cones five inches long, by two-and-a-half at the broadest part, of a reddish brown, the centre of the scales terminating in a small sharp point, bent downwards. The trees rise to the height of a hundred feet, with a stem three to four feet in diameter, producing the cones in clusters of three or four, which ripen towards September, or in about eight months from the time of flowering. This handsome species of pine, which appears to be new, I have named, in compliment to the late secretary of the Society, George Benthams, Esq., *Pinus Benthamiana*.

"Another kind of pine that I found within a few hundred yards of the foregoing species, is, probably, the doubtful and little known *Pinus californica* ; the trees seem to be of slow growth, and do not attain any great height, seldom more than twenty-five feet by eight inches in diameter. The leaves are in bundles of three, four-and-a-half inches long ; cones, five to five-and-a-half inches long by two broad, the outer surface curved, the inner straight, scales on the outer surface more developed, enclosing two small, flat, winged seeds. The cones are only produced on the main stem ; when ripe, they are of a light-brown colour, and stand off at nearly a right angle ; when old, of a silvery grey, pressing firmly upon the stem, and remain on the trees for a series of years without opening or shedding their seeds.

"On August the 28th, the bark got under weigh for Yerba Buena. The whole of the coast is destitute of trees or shrubs, with the exception of Point Año Nuevo, where some pines or cypresses seem to grow. On September the 2d, we were opposite the narrow but safe entrance to the bay of San Francisco ; a large inland sea, divided into several branches, forming not only the principal port in California, but the largest and safest on the whole western coast of America. About noon we anchored off Yerba Buena, a small town, rising rapidly in importance.

"The vegetation about Yerba Buena is poor ; the sand-hills that surround the town, and which extend for several miles into the interior, are but thinly covered with brushwood of oak, (*Quercus californica*, *Ceanothus thyrs-*

siflorus, Rhus, 'Toyon,' a Prunus, and a Baccharis.)

"On September the 10th, I went across the bay to Sausalito. Early the following morning, we were joined at the mission of San Rafael, by General Vallejo. After enjoying the hospitable board of General Vallejo for three days, I left my companions and proceeded with F——, an Englishman, to his farm at San Miguel, distant thirty miles, where he is established with two of his countrymen in raising grain and rearing horses and cattle. The face of the country about Sonoma and San Miguel is perfectly level towards the bay, and capable of great agricultural improvements. Several species of oak (*Quercus*) thrive well in the fine black vegetable mould, and are disposed into large irregular clumps, giving the country the appearance of an immense park, enlivened by numerous herds of elks and antelopes. A ridge of mountains which rises at a short distance from San Miguel is thinly scattered over with oaks, and a few *Abies Douglasii* interspersed. No other kinds of pine occur here. In the shaded dells I found a *Viburnum*, *Euonymus*, and a large-leaved *Calycanthus* in seed.

"From San Miguel I went to Bodega, where the Russians a few years back had an establishment granted them by the Mexican government, in order to supply their possessions in the north with wheat, &c. When their term expired, it was purchased by Captain S——, an American, who erected a steam saw-mill there, for which the redwood trees that cover the mountains supply him amply with material. This is the most northern limit of this magnificent tree, growing at intervals from the latitude of 32° N. up to the river Ross in 38° 15'. From Bodega I returned by way of San Rafael to Sausalito, passing over a beautifully undulated prairie, destitute of water or trees. On October the 7th I returned to Monterey.

"With the beginning of November the periodical rains have set in; they are unaccompanied by thunder, but continue for several days without intermission, and terminate by the end of March. The heaviest fall of rain occurs in January and February. Judging from the quantity that fell up to the middle of December, it would seem that the rains will be more abundant than for some years past. El Toro, which lies due east of Monterey, has already been twice covered with snow, but it soon disappeared again. The rainy days are succeeded by frosty mornings, but the cold is seldom so intense as to freeze water. The thermometer, which ranges in Monterey during the summer months from 62° to 65° of Fahr., is now from 50° to 55° during the day." *

* Vol. ii. part iii. pp. 187—191.

"With January the rains set in unusually severe; the Salinas and other rivers, which are fordable during ordinary seasons, have now become impassable. The first indications of the returning spring I observed in the flowering of *Garrya elliptica*, *Berberis Aquifolium*, *Ribes speciosum*, *R. malvaceum*, some *Arctostaphylos*, a *Vaccinium*, a dwarf shrubby *Prunus*, with white pendulous flowers, and an *Ornithogalum*.

"When the weather permitted it, I continued my rambles on foot in the mountains of Monterey, and discovered on the western declivity, within two miles of the sea shore, a species of Pine which I had not found previously. The leaves are two in a sheath, three to five inches long; cones in clusters of four to seven, oval, three inches long by two broad, of a reddish brown before they are perfectly ripe, then changing into light brown; scales pyramidal, terminating in an ash-grey sharp point. The trees attain no great elevation, averaging twenty feet, rarely thirty, with a stem of twelve inches in diameter; they are confined to half a square mile, and like *P. insignis*, by which they are surrounded on all sides, thrive in coarsely decomposed granite. This species, which appears to be new, I have named, in compliment to Thomas Edgar, Esq., the Society's Treasurer, *Pinus Edgariana*. In the same locality with the above Pine, I observed a Cypress (*Cupressus*) with smaller cones than *C. macrocarpa*, of which it seems more than a variety, being a stunted shrub six to ten feet high.

"Returning by a different route, through a thick brushwood of *Arctostaphylos* and *Ceanothus*, I found on the steep acclivity, in a shaded dell, a *Rhododendron*, without seeds or flowers, forming a shrub five feet high, well beset with flower-buds, and *Castanea chrysophylla** in the same condition; this evergreen Chestnut forms a shrub three to eight feet high, of a pyramidal shape, with persistent lanceolate leaves, green above, and of a rich golden yellow below. From its situation, and habit in general, it may be expected, if I am fortunate enough to introduce it, to withstand the ordinary winters about the neighbourhood of London, since it is known from experience, that *Ceanothus thyrsiflorus*, with which it grows, is of that degree of hardiness.

"In February, a species of *Dodecatheon* appeared everywhere common, as also *Fragaria vesca*, a *Cardamine*, a *Viola*, a *Saxifraga*, and two *Trilliums*; of shrubs, two species of *Ceanothus*, the one producing numerous bundles of blue flowers from the axils of its small evergreen leaves, the other,

* "What was called so formerly is a different species of *Castanea*."

C. thyrsiflorus, often attaining the size of a small tree, sending forth its numerous heads of azure flowers from last year's wood. In the sandy plains towards the river Salinas, the large, golden-flowered *Viola chrysantha*, *Nemophila insignis*, *Eschscholtzia crocea*, and *E. californica* were common.

"My sojourn in California being restricted according to my instructions to one year, whilst a similar period is to be devoted to visiting the northern provinces of Mexico, or in case I find this country a favourable field for my exertions, permission having been granted, until I receive orders to the contrary, that I may stay the whole term of two years in California: I resolved, in the absence of new instructions from the Council of the Society, not to proceed to northern Mexico, where, during the war with the United States, my peaceful occupation might be disturbed, and my personal safety endangered, but to remain another season in California; more especially as, from my late arrival in this country, and subsequent circumstances, I could not extend my excursions as I intended to have done. The next step to be considered is, whither can I proceed to follow my occupation with satisfaction to my employers and myself? This country has been taken possession of last year by an American force, much against the good will of the Californians. Now, although the country is apparently quiet, it is difficult to foretell how long it may last, and if these disturbances should break out again during my busy season, it might seriously affect my plans. I therefore came to the conclusion of visiting the Sacramento Valley, where the settlers are all foreigners, and where I need not be under any apprehensions of disturbances in the lower country.

"Accordingly I embarked on the 8th of March on board the American bark *Tasso*, and arrived at Yerba Buena after a passage of five days. A few days' detention enabled me to examine the neighbourhood, and added to my collection, among other less interesting plants, a white *Myosotis*, a Liliaceous plant, an *Oenothera*, a scarlet *Aquilegia*, an *Iris*, and *Ribes echinatum*, the latter common on the sandhills that surround the town.

"On March the 23d I embarked in a small launch with Mr. Cordua, who was proceeding to his farm in the Sacramento Valley, and who kindly invited me to make his house my headquarters; an invitation which I gladly accepted, as from his long residence in the country, and the situation of his farm, in the centre of the valley, I anticipated many happy results. Late in the afternoon of the following day we arrived at the Corte de Madera, which, as the name implies, is a woodcutting establishment, where Mr. Cordua had some busi-

ness to transact. Half-an-hour's ramble in a fine grove of redwood trees furnished me with a brown, small flowering *Martagon*, a Boraginaceous plant, and an *Equisetum*. The same night we left again, and passing the following morning through the straits of Carquinez into Suisun bay, we entered the river Sacramento in the afternoon. The aspect of the country is flat, presenting a boundless field of rushes as far as the eye can reach, bordered on both sides by a distant ridge of mountains, which, from the severity of last winter, presented a line of snow. The lowlands of the Sacramento are subject to inundations during the spring months, and are destitute of trees, with the exception of the banks, which, from the accumulation of soil during the inundations, are higher than the rushlands; a belt of trees and shrubs, varying from thirty to two hundred yards in depth, extends along the banks, and is chiefly composed of Oaks, *Platanus*, Willows, *Poplars*, Ash, *Negundo californicum*, *Pavia californica*, *Cornus*, a dwarf Birch, and a Grape-vine. After a tedious process of warping up the launch against a strong current, we arrived at the landing-place of Fort Sacramento, on the 31st of March.

"The vegetation in the Upper Sacramento valley is much earlier than about the bay of San Francisco; there the trees were still apparently dead, whilst here the Oaks were sending forth their young leaves, and the prairies were teeming with flowers, among which I recognised many old acquaintances. It was delightful to behold the variety of colours over the extensive prairie, produced by patches of a *Leptosiphon*, *Gilia tricolor*, *G. capitata*, *Oxyura chrysanthemoides*, *Platystemon californicum*, *Nemophila insignis*, and another species, two *Compositæ*, a *Viola*, *Eschscholtzia crocea*, *E. californica*, a *Delphinium*, and, in places where water collects during the rainy season, a *Martagon*, with dingy yellow flowers spotted with brown, *Mimulus tricolor*, two inches high, and *Limnanthes pulchella*, having an abundance of delicate pink flowers.

"On April the 13th I left with Mr. L. for his farm, seventy miles higher up in the valley. Mr. L. had been in the lower country, and came up thus far with his goods in a large canoe, and was now proceeding with them in waggons. Crossing Feather river, which here is eighty yards broad, and of considerable depth, our course lay five-and-twenty miles along that river, through a beautiful wood of evergreen and deciduous Oaks: here I found, in sandy tracts, a *Leptosiphon*, with white fragrant flowers; and *Collinsia*, and *C. bicolor*, the latter invariably growing at the foot of large oaks. Leaving Feather river, we struck across a prairie for twenty miles: here

immense fields of *Eschscholtzia crocea*, *E. californica*, and a *Ranunculus*, presented themselves, each species growing by itself, which with the plants observed on Mr. Cordua's farm, and *Lupinus nanus*, two *Delphiniums*, a *Trifolium*, several *Compositæ*, an *Enothera*, and a Malvaceous plant, produced a splendid effect. A small patch of the beautiful little *Leptosiphon aureus*, with golden flowers, I also found in the open prairie; it is, however, by no means common. The prairies in the Sacramento Valley are divided by small rivers, termed 'creeks' by the American settlers: these creeks generally have a border of Oaks upon their banks, which also extend over the rich bottom lands. In the dry beds of these rivers I observed plants which nowhere are to be found on the prairie, the seeds of which have evidently been carried down from the mountains during the rains, as for example, *Pentstemon azureum*; an Umbelliferous plant, with an aromatic tap-root, held in repute among the Indians for its medicinal properties; in rather damp places, *Clintonia elegans*, *C. pulchella*, and *Limnanthes alba*. A four days' slow drive with the waggons brought us to the farm of my companion: the vegetation here differed in no respect from that already observed in the valley.

"An opportunity of visiting the mountains was afforded me a few days after my arrival, which I embraced with pleasure, as from the hostile character of the mountain Indians towards the settlers, it was not deemed prudent for me to make an excursion in that direction, attended by a guide only; I therefore joined a party of settlers who were going to the mountains to examine the timber, and if possible to find a site for a saw-mill. On the first evening we encamped under a large oak, near Pine creek, a little mountain rivulet; here I found *Asagrea*, a *Lychnis*, an Umbellifer, *Triteleia*, with a head of pink flowers supported on a *twining* stem, five feet long; in the creek, a *Saxifraga*; of shrubs and trees, a *Ceanothus*, evergreen and deciduous Oaks, and *Pinus Sabiniana*. This species of Pine, of which I saw some small trees near Monterey last year, rises here to the height of fifty or sixty feet, with a stem of six feet in circumference, and possesses none of the regularity so characteristic of the Pine tribe. The branches, which in other Pines stand in whorls, are in this species quite irregular (except when young), which, combined with the paucity of its partly bent down, glaucous leaves, gives the tree a peculiar appearance. Early the following morning we ascended the gradual acclivity, and passed through a brushwood entirely composed of a species of *Ceanothus*. At noon we arrived at the edge of a noble Pine forest; a few moments' rest, during

which one of our companions shot a deer, enabled me to collect a *Viola*, an *Erythronium*, a *Prunus*, a *Lilium*, and a *Cyclobothra*. The species of Pine composing the forest is principally *Pinus Benthamiana*, with a few trees of *P. Lambertiana*, *Abies nobilis*, and a species of *Thuja* intermixed, a *Ceanothus*, spreading on the ground, and *Cornus florida*, which were the only plants observed in the pinewoods. On our return through a steep ravine, I found a shrubby *Cercis*, with pink flowers, a *Prunus*, and again *Cyclobothra*.

"By the end of April the prairies in the Sacramento Valley assumed a different aspect; two weeks ago they were a carpet of flowers, which have now disappeared, and a yellow, sickly tinge pervades the whole: such is the rapidity of vegetation under the cloudless sky of a tropical sun. Bulbous plants now make their appearance; the most common being *Triteleia laxa*, which not only grows in the open prairie, but also in the shaded and damp lowlands; a pure white variety of it I also found; it is, however, by no means common. One of the species of *Calochortus* is also very frequent; a whitish variety occurs occasionally along with *Brodiaea congesta*, and another Liliaceous plant.

"Being now aware of the rapidity of Californian vegetation, I lost no time in collecting such seeds as were worth taking, and returned to my head-quarters by the beginning of May. Most kinds had, during the fortnight since I first saw them in flower, ripened their seeds, and it was with difficulty I found a few grains of the beautiful little *Leptosiphon aureus*, and similar plants, which, between their taller neighbours, had almost become invisible.

"An excursion to 'the Butes,' an isolated group of mountains between the Sacramento and Feather rivers, furnished me with species of *Campanulaceæ*, *Labiata*, *Scrophularinæ*, and *Compositæ*; a *Gilia*, a *Linum*, a *Trifolium*, two species of *Asclepias*, *Clarkia elegans*, *Lupinus densiflorus*, and an Umbellifer, called *Yerba de la vivora*, the leaves and stem of which are universally used with success against the bite of rattlesnakes. From the rocky summit of the Butes a beautiful view is obtained of the Sacramento Valley; during the time of my visit, the lower country, owing to the melting of the snow in the mountains, and consequent inundations, presented an immense lake.

"Another excursion I made to the mountains led along the right bank of the Chuba river, over the now parched up prairie. A ride of fifteen miles brought me to the foot of the mountains. The lower range, as in the former visit higher up in the valley, is occupied by a *Ceanothus*, a few live Oaks, and *Pinus Sabiniana*. Following a small rivulet, I found

there a *Mentha*, and another Labiate plant, *Stenactis*, a shrubby Labiate with large white flowers, and *Collinsia tinctoria*. This new species of *Collinsia* is of stronger growth, though less striking, than *C. bicolor*; it grows chiefly in the dry sandy bed or on the banks of the rivulet, and produces its yellowish flowers mottled with purple much later than *C. bicolor*. On a subsequent occasion, when I returned to this place to procure seeds of it, my hands were stained yellow by the glandular hairs which cover the seedpods, from which circumstance I named it *Collinsia tinctoria*. Another interesting plant I found on this excursion is *Nemophila speciosa*, with white petals, one-third of which is tipped with purple. It grows generally near rivulets, or in damp and partly shaded places. If the few seeds I procured should vegetate, it will prove a great acquisition to that handsome genus. The higher part of this range of mountains is less accessible than on the former visit. My endeavours to proceed farther were eventually frustrated by the steep banks and swollen state of the Chuba.

"By the beginning of June I set out again, in company with Mr. Cordua and an Indian, to visit if possible the snowy heights of the mountains, generally termed by emigrants from the United States the Californian Mountains. After crossing the Chuba river, we struck across the prairie, and entered the mountains near Bear Creek, where we encamped towards evening in a grove of *Pinus Sabiniana* and Oaks. The vegetation here differed in nothing from that observed on the right bank of the Chuba on a former visit. *Calochortus*, which had been very common throughout the Sacramento Valley, was still in flower here, the white variety being more frequent than the yellow. Early the following morning we were *en route* again, passing through an interminable wood of *Pinus Sabiniana* and Oaks. Here I observed a pretty little *Allium*, with purple flowers, an *Asarum*, a *Viola*, a *Polemonium* (?), *Hosackia bicolor*, and *Mimulus bicolor*, the two last luxuriating in the sandy bed of dried up rivulets. Ascending the gradual acclivity, we left the region of *Pinus Sabiniana*, and entered that of *Pinus Benthamiana*, which seems to be the characteristic of the upper region. Some trees of this noble Pine attain an enormous size. The largest I measured were 28 feet in circumference, and 220 feet high. Of equal dimensions is *P. Lambertiana*, which, however, does not constitute masses by itself, but is thinly scattered among the former. The same is the case with a *Thuja*, which rises to the height of 130 feet, by 12 to 15 in circumference. Few plants occur in these Pine tracts; the principal being some *Cyclothrass*,

a *Calliprora*, an *Iris*, *Papaveracea*; and, in shaded places, a *Rubus*, a *Philadelphus*, a *Spiræa*, *Pyrus florida*, a Rosaceous plant, and a *Taxus*—the latter, judging from the few specimens I saw, attaining only the size of a shrub or small tree.

"On the fourth day we reached Bear Valley, a beautiful little mountain valley surrounded by a lofty ridge of mountains, which is well wooded with *Pinus Benthamiana*. The north side of the valley was still covered with snow. On the south side, however, a few spring flowers had made their appearance, among which I observed *Pæonia californica*, with brown petals edged with orange; some *Compositæ*, a *Ranunculus*, a *Corydalis*, and a *Nicotiana*. A new species of a Pine occurred in the valley, of which I only saw two trees of dwarf growth, probably stragglers from a more northern latitude. The leaves stand in pairs, and are three inches long; cones two inches long, by one broad. In general appearance the tree is not unlike a young Scotch fir. The cones at the time of my visit were open, and the seeds had fallen out. The upper end of the valley is bounded by a mass of granite, terminating in a precipice 800 feet in depth, below which the Chuba river is winding its way, appearing like a sheet of foam. In warm and sheltered situations, where the snow had melted, I observed an *Allium*, a *Pentstemon*, a *Statice*, a *Phlox*, and a *Calochortus*—the latter not yet in flower. The more elevated parts above Bear Valley, from the severity of last winter, were still, several feet deep, covered with snow, for which reason we returned hence by the same road we came. Immediately upon my arrival at headquarters, I proceeded once more to the Upper Sacramento Valley to collect such seeds as I could not procure before.

"Having packed up my collections, and sent part by water to San Francisco, I left on the 30th of June for Monterey, in company with an American whom I had engaged as guide. Towards evening of the same day we arrived at the junction of the Feather river with the Sacramento; and passing, the following morning, our luggage over in a canoe, we swam the horses across; the distance from shore to shore being not less than 300 yards. We now continued our course over the prairie on the right bank of the Sacramento river for two days, and crossed again to the south side in a ferry-boat, at the Straits of Carquinez. A kind of tertian fever, accompanied by violent headache, under which I had been suffering some days previous to my departure, here developed itself into a quotidian fever and ague, which for want of proper medicines, the constant exposure to a tropical sun during the day, and camping out at night, soon reduced

me to such a state of debility as scarcely to be able to sit on horseback.

"From the Straits of Carquinez we passed along the Bay of San Francisco to the Pueblo of San José, and reached Monterey on the 8th of July. Soon after my arrival (having, with the assistance of my little medicine-chest, cured myself), I continued my excursions about Monterey as far as returning strength permitted, and collected such kinds of seeds as I thought worth preserving. Towards the end of July I went over to Santa Cruz for a similar purpose, and whilst visiting a family upon their farm, with whom I had become intimately acquainted during their winter residence in Monterey, I was again taken ill with fever and ague. In addition to the seeds which I collected in the Santa Cruz mountains last year, I found the evergreen Chestnut with ripe fruit. This shrub, of which I had been most anxious to procure seeds, attains the height of ten feet, and is of a pyramidal form. The nuts, which are produced in prickly clusters on the points of the young wood, are each enclosed in separate cells, and are of the same size and shape as the beech-nut. The kernel is pleasant to eat, resembling the filbert in flavour.

"On August the 13th I returned to Monterey, and was once more laid up with fever and ague, from which I did not recover until the beginning of September. On September the 6th I went again over to Santa Cruz in quest of pine-cones, which were now ripening. The sorts I procured were *Abies Douglasii*, *Pinus Californica*, and *P. Benthamiana*. The cones of the latter were unusually scarce this season, and seem to have suffered from late spring frosts. A few cones were all I could procure of this sort. They were smaller than those of the preceding year, and contained but few good seeds.

"On September the 20th I again left Monterey for the southern parts, which, on account of the disturbed state of last year, I could not visit before. As guide I engaged the services of a man who had accompanied me on my last excursion to Santa Cruz, and who, from his profession as a hunter, was well acquainted with the intricate mountain paths of the district I intended to visit. On the day of our starting we reached the mission of La Solidar, an ill-constructed, half-ruined building, situate in the Salinas valley, and encamped towards evening on the banks of the Salinas river, within a short distance of the mission. By sunrise the following morning we were again on horseback, and leaving the main road on the right, we entered a mountain defile leading to the mission of San Antonio. Here I observed a shrubby *Arctostaphylos*, with large brown seeds; a half-climbing *Caprifolium*,

profusely covered with scarlet berries; an evergreen shrubby Oak; and a subdeciduous Oak, the latter forming a tree thirty feet high.

"From San Antonio a range of mountains extends along the coast, attaining a great elevation, which, although apparently barren as seen from the mission, I was assured, on the western flank towards the sea is covered by large Pines. The lower region of this range, at the foot of which the mission is built, is thinly covered by the evergreen Californian Oak, a *Ceanothus*, *Cercocarpus*, a small-leaved shrubby *Fraxinus*, and *Pinus Sabiniana*—the latter at the time with ripe cones. An evergreen shrubby *Prunus*, called Islay, with a holly-like leaf, bearing a red fruit resembling the cherry-plum, grows also abundantly here. The thin pulp which surrounds the proportionate large seed is sweet and pleasant to eat. The kernel, after being roasted and made into gruel, is a favourite dish amongst the Indians. Having ascended the first ridge, we passed through thickets of *Arctostaphylos tomentosa* and *Ceanothus thyrsiflorus*, and entered a forest of *Pinus Lambertiana*. The cones of this noble Pine are always hanging from the points of the branches, were by this time already open, and the seeds had fallen out. From cones that had been blown down, I picked out a few seeds.

"Descending the western flank of the great mountain range, I found at last the long-wished-for *Abies bracteata*, occupying exclusively ravines. This remarkable Fir attains the height of fifty feet, with a stem from twelve to fifteen feet in diameter, one-third of which is clear of branches, and the remainder forming an elongated tapering pyramid, of which the upper part, for three feet, is productive of cones. Having cut down some trees, I found to my regret that the cones were but half-grown, and had been frost-bitten. In more sheltered situations, towards the sea-shore, the same happened to be the case; and I was thus precluded all hope of introducing this remarkable Fir into Europe.

"Finding it impossible to prosecute my journey to the south along the coast, from the numerous ravines which descend from the mountain range, I returned hence to San Antonio, and crossed by the farm of El Piojo, where the ridge is less elevated. A small Pine wood, which became visible on our descent, extending along the beach, looked like an oasis in the desert—the dark green of the Pines forming a beautiful contrast with the parched-up fields. Upon a nearer examination, I found the wood to be composed of a variety of *Pinus insignis*, with larger cones than those about Monterey, from which it also differs in their being produced in less abundance. Following along the sea-shore for

nine miles, we struck inland again, and arrived at the mission of San Luis Obispo, from whence we proceeded over a flat and uninteresting country to the mission of Santa Ines. The whole of this route is but poorly wooded by a few stunted Oaks. On the ascent to the mission of La Purissima, the monotony of the bare hills was somewhat relieved by a small forest of *Pinus Edgariana*, which attains no larger size than those observed near Monterey.

"Previous to leaving Monterey I was told by several persons that a kind of thin-shelled pine-nut is occasionally brought for sale by the Indians to Santa Ines and Santa Barbara, without being able to learn any more respecting it. Upon making further inquiries at Santa Ines, I was told that the Indians bring them from a great distance, that the harvest of them was over, but that I might procure a few of the mission Indians. Proceeding to a hut which was pointed out to me, I bought a gallon of the fresh seeds; and inquiring about the size of the cones, the Indian handed me two, with the information that the trees are of a small size; when, judge my surprise, I recognised in them those of *Pinus Llaveana*, which I had on former occasions found in several parts of Mexico.

"Seeing there was no prospect of enriching my collection of seeds by proceeding further to the south, I returned from Santa Ines to San Luis Obispo, near which mission the late Dr. Coulter gives the station of *Pinus muricata*, and which seemed to have escaped my notice when first passing through that place. Upon a nearer examination I found that on the 'Crusta,' or ascent from San Luis Obispo, only one kind of Pine is growing on the brow of the mountains, which proved to be *P. macrocarpa*. From San Luis we returned to San Antonio, over a flat and uninteresting road, and thence to Monterey, where we arrived on the 18th of October.

"On October the 25th I again left Monterey, with my former guide, to visit the continuation of the San Antonio range of mountains, which, from the nature of the ground on that side, I attempted now by a different route. Following along the sea-coast over a succession of hills intersected by numerous deep ravines, we found our further progress impeded on the third day by the extreme steepness of the range. The only objects derived from this excursion were some very fine cones of *Pinus macrocarpa*, some measuring fifteen inches in length; they were growing on trees thirty to forty feet high, in rather exposed situations, at an elevation of about 4,000 feet above the level of the sea.

"By the beginning of November we returned to Monterey. The rainy season being now close at hand, and having no more ex-

cursions to make, I prepared to return to Europe with my collection. Owing to the little traffic carried on between California and the western ports of Mexico or central America, I did not procure a passage before the 5th of February. I arrived at Southampton, after a very fine passage, on the 3d of June."*

Such is Mr. Hartweg's account of his proceedings. Doubtless many interesting plants will in consequence be added to our collections. The following were reported on May 1st, as being the most important of those received alive, or which had been raised from seeds, within the year from this expedition:—

"*Cupressus macrocarpa*, *Hartweg*. A tree sixty feet high, from the sea-shore near Carmel Bay.

Pinus Benthamiana, *Hartweg*. A tree 100 feet high, from the mountains of Santa Cruz.

— *Sabiniana*.

— *macrocarpa*.

— *insignis*.

— *californica*? A tree from fifteen to twenty feet high, from the mountains of Santa Cruz.

Abies Douglasii. From the mountains of Santa Cruz.

Corylus. A shrub six to eight feet high. Found in woods near Santa Cruz.

Rhamnus, called 'Yerba del Os.' A shrub six feet high. Monterey.

Quercus. Several species; one called the Chestnut Oak, another an evergreen, another with large sweet acorns.

Pavia Californica; the Californian Horse Chestnut.

Prunus. One or two species.

Calycanthus macrophyllus, *Hartweg*. A shrub six feet high, along the side of rivulets near Sonoma.

Laurus? A large tree from the mountains of Santa Cruz and Sonoma.

Arctostaphylos tomentosa.

Ceanothus. Two or three species; apparently *C. rigidus*, *papillosus*, and *dentatus*.

Garrya elliptica; the female.

Sambucus.

Hugelia. Some annual species.

Gilia pharnaceoides. An annual from the Carmel mountains.

Madaria corymbosa. An annual with white flowers. Found in fields about Sonoma.

A *Lilium*. Apparently new.

Several species of *Lupinus*, *Aquilegia*, *Lathyrus*, *Malva*, *Leptosiphon*, and *Delphinium*, &c. &c.

An *Abronia*; with pink, sweet-scented flowers. A perennial spreading over the ground like a *Verbena*. From the sea-shore near Monterey.

* Vol. iii. pt. iii. pp. 217—228.

Asclepias. A perennial species.

Nicotiana? A perennial with large white flowers.

Zauschneria Californica. A very pretty perennial, found in fields about Santa Cruz.*



BRITISH WILD FLOWERS.

THE HYDROCHARIS, OR FROG-BIT.

Hydrocharis Morsus ranae, Linnæus (common Frog-bit).—Hydrocharidaceæ § Stratiotææ.

This is a common ditch-weed, but yet its flowers are handsome, and the plant is worthy a place in ornamental water scenery, where, however, it is not very often seen. Its recommendations are, that it throws an ample floating mantle of shining deep green leaves over the surface of the water, and towards the latter end of summer a covering of snowy whiteness is superadded by the development of its blossoms. The chief objection to it is that it is of rapid growth, and is apt, in situations suitable to it, to appropriate to itself too great a share of the crystal surface.

There is but one species, the *Hydrocharis Morsus ranae*, which is essentially a floating plant, having no hold of the soil, and no other support than the bosom of the waters. The stems throw out runners, and these grow and

become in their turn parent stems, and thus the plant goes on extending itself, and rapidly covering the surface. Both the stems and leaves are smooth. From the stems are produced numerous long, perpendicular, thread-shaped fibres, which are bearded towards the end with numerous radicles. The runners consist of slender thread-like stalks, furnished with pendulous gemmæ, or buds, these buds consisting of two convoluted or stipulaceous scales, resembling leaf-scales, within which are curiously enveloped the embryo leaves of the future stem. The leaves are stalked, from an inch to an inch and a half in diameter, tough and of leathery texture, kidney-shaped, or nearly orbicular with an indenture at the insertion of the stalk; they are quite entire, and smooth, and shining green above, beneath of a purplish tinge. On removing the outer skin when the leaves are dried, a beautiful close net-work of veins may be seen. The plant is diœcious; that is, producing fertile and sterile blossoms on different individuals, one plant producing only one kind of bloom. The sterile flowers grow in a spathe, which is supported on a long stalk; from this spathe most commonly three blossoms are produced in an umbellate manner. The fertile ones grow singly, and are without a spathe. All the flowers are formed of three roundish petals, which are of delicate texture, and of a white colour marked with yellow at the base. Within the circle of the petals are the stamens, which are nine in number, disposed in three series: six of these, which are shorter than the rest, curve outwards, and the remaining three—the most interior in position—have each arising from its base an awl-shaped appendage resembling a style; the proper styles, however, are six in number, and placed in the very centre of the flowers. The seed-vessel is round, six-celled, each furnished with numerous small roundish seeds.

The plant is found to grow in ditches, ponds, and streams, where the current is slow and the water rather shallow. It quickly spreads itself over the surface, when it is once established, and produces its blossoms, which are just elevated above the water-surface, in July and August. It is generally rather common, but is rare in Scotland.

Very little cultivation is required, for the plant is increased by detached pieces of the stem cast into the water before they become shrivelled up, which grow and spread without any further attention. It is by no means essential that a plant should be fixed in the soil by any means at the first, for if one of the old stems, provided with the runner buds already explained, is cast into the water, and allowed to float, as it will, it will in due time become developed, and a plant estab-

* Vol. iii. pt. iii. p. 175.

lished. The only care it will subsequently be likely to require, will consist in cutting away such portions as may have become too widely extended in any particular direction.

The Frog-bit has been compared, and not inaptly, to a pigmy *Nymphæa*. The herbage is regarded as being mucilaginous and slightly astringent.

THE SCOTCH THISTLE.

The name of thistle is perhaps not a very alluring one to be borne by a candidate for garden cultivation; but though thistles, generally speaking, are weeds, and very troublesome ones too, there are one or two kinds of which an individual or two, placed in situations where there is sufficient space for them to develop their characters, assume a rather striking aspect. One of these, occurring not unfrequently by road-sides, and in other exposed places, is the *Onopordon Acanthium*, the plant which is regarded as the veritable symbol of our northern neighbours. That thistle however which is introduced by sculptors and other artists, among the armorial emblems of these realms, is not this species, but the *Carduus nutans*, or musk thistle, which is selected on account of its possessing a greater degree of elegance of outline.

Our present subject, which, besides the names already quoted, bears those of Cotton Thistle, and common Argentine, is a biennial plant, asserting a rather noble character where it has space afforded for its growth. It grows from four to six feet in height, with an erect sturdy central stem, from which are produced numerous branches, and both the central stem and branches bear several heads of flowers, which are so prickly, from the stiff spinose extremities of the scales of the involucre—that is, the green bodies placed just beneath, and enclosing the head of blossoms—as to afford an excellent illustration of the motto, *Nemo me impune lacessit*.

The stems of this thistle are winged, and those who desire to become acquainted with the meaning of this term, as applied in a botanical sense, could hardly find a better illustration thereof than is in this afforded. It will be seen that, running parallel with the stem, and attached to it, is a narrow leafy fringe, perfectly distinguishable in shape and appearance from the leaves, but of the same nature and texture, and moreover furnished along its exterior margin with keen pointed prickles, as are the margins of the leaves themselves. Besides this, both the stem and the leaves are clothed over with a kind of cottony down, which gives the whole plant a hoary aspect, even when growing in its greatest vigour; the amount of this clothing is however subject to variation. The lower leaves are large, and

often become partially decayed by the period when the plant is in a perfect flowering state: the outline of the leaves is oval lanceolate, but the margin is deeply and irregularly divided by somewhat triangular dents or sinuities, the salient parts being furnished with stiff spines. The leaves in the upper part of the plant become proportionately smaller. The flowers are violet coloured, and grow in little heads at the end of all the branches. Closely fitted around the exterior of these flower heads, are several series of scales, which lie over each other like the tiles of a roof; they fit closely, however, only at the base; the upper part is bent outwards, so that the points of these scales spread out in all directions, and then being formed into stout sharp spines, the flower heads may be said to almost bid defiance to the touch. As a whole, the plant may be admired for its stateliness of growth. It blossoms in June and July.

We find it stated in old books, that the receptacles of the flowers, and the tender stalks peeled and boiled, may be eaten in the same manner as artichokes and cardoons.

It is scarcely necessary to allude to the culture of such a plant as this, which, if allowed to scatter its seeds, becomes a troublesome weed. Every plant will bear and perfect hundreds of seeds, and every one of these seeds is furnished with a downy crown, or pappus, as it is called, which is sufficient to buoy it up in the atmosphere, and thus it floats about and is carried over every part of the garden. This renders it necessary, that as soon as any of the heads approach maturity, they should be plucked or cut off, so as to obviate this source of annoyance; and when the majority have been thus removed, and the plant perhaps begins to look unsightly, it should be altogether removed. One plant would be sufficient in almost any garden, and even one would be too much for a small garden; but, to have one plant to blossom each year, a fresh plant must be raised annually, as they are two seasons in attaining a flowering condition. A few seeds may be preserved as they ripen; these sown in August, and transplanted as soon as they have attained a little size, will flower the next year.

GARDENING MEMORANDA FOR AUGUST.*

THE budding of roses in some seasons has not yet been completed, and if there be any good reason for doing it, there is no immediate evil arising from being late. In dry seasons, indeed, the bark of the brier may not

* A very elaborate and complete Calendar of Gardening Operations for August is published in No. 32 of the Horticultural Magazine.

rise so freely, but in general it is successful this month. The suckers which come up from stocks require removal; the growth of the budded stocks must always be stopped at once by rubbing off the buds as they appear, and where there are many worked roses, the examination for this purpose only must be frequent. The layering of carnations and picotees is a formidable job this month, though some begin it earlier, and divide the labour, but as no plants are better than those layered in the early part of August, and cut off at the end of September, it is better to do them all at once, and have done with them, than having many different seasons. Potting the auriculas is another subject that demands attention, and all those that require it must be placed in pots of a larger size, but unless the plant is exceedingly healthy, and the condition of the root unequivocally good, the mould should be shaken out, the root pruned, all indications of disease cut away, and the plant be put into a pot the same size as it came out of. The Dahlias are beginning to flower; the seedlings being necessarily many very bad to one good, they cannot be too quickly removed when found useless. The named flowers require constant attention to the staking out, making fast against wind, and if for exhibition, partial shading. Cuttings, too, may be taken from such as are known to be worth it, and struck in a hot-bed. The fruit garden wants a little attention to the destruction of wasps, snails, slugs, ants, and the other thousand pests of the gardener; but the most effective mode of preserving choice fruit or wall trees from the depredations of wasps and flies, is to cover the entire wall with a thin open kind of muslin, which is very cheap and very effective. It may not prevent slugs and snails already in the tree from making free, but before the

muslin is put on, the wall should be well examined. The grafted stocks of fruit trees should be looked over, and the portions of stock that are growing, if any, must be removed. So also the roses budded last month, and any portion of stock that may be growing should be taken off. Watering and weeding must not be forgotten any where. Rhododendrons and Azaleas towards the end of the month have set their bloom, and may be removed if required any time from now till a month before blooming time. Cuttings of all sorts of stove and greenhouse plants can be taken and struck. This is just the time to repair, clean, and if necessary, paint the houses. The plants take no harm out of doors; the lights may be all taken off, examined, and set to rights, the inside all washed, repaired, and the whole painted; and if the roof water runs into any place to be saved, remember, that while it is impregnated with the white lead of the paint, it is poison to the plants. Let all the pits and garden frames and lights share the same renovating process, and every thing be got ready to receive the winter contents next month.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING AUGUST.

The Greenhouse.—From seventy to seventy-five degrees by day, and from sixty to sixty-five degrees by night.

The Conservatory.—From sixty-five to seventy degrees by day, and at night sixty degrees. Shade in bright weather.

The Plant-Stove.—From seventy to eighty-five degrees by day, and sixty-five to seventy degrees at night.

The Orchid-House.—The warm or Indian house, eighty-five to ninety degrees by day, and seventy-five degrees at night. The cool or Mexican house, seventy-five to eighty degrees by day, and at night sixty-five degrees.

FLORISTS' FLOWERS.

DAHLIAS.—Mr. Harrison has obtained from seven principal growers or judges of the Dahlia, a list of the best twenty-four Dahlias in each class, Selfs, Edged, Shaded or Mottled, and Fancy, and it is worth while to observe how far these authorities agree; but there is one point against it as an original thing, Glenny's list has been published in the almanack, and the majority select their sorts from that source. However, as it is possible that one flower can have seven votes, we will sum up the affair, not forgetting to thank Mr. Harrison for the service he has rendered by drawing out such men as Glenny, Keynes, Barnes, Gaines, Spary, Whale, &c. To sum up the evidence on behalf of the several flowers:—We will first take those with seven

votes, or such as are unanimously voted to be of the best; then close with six, five, and so on.

SELS WITH ALL SEVEN VOTES; THAT IS, IN ALL THE LISTS.

Beeswing, Drummond, red.
Fire King, Turville, orange scarlet.
Marchioness Cornwallis, Whale, blush.
Nonpareil, Proctor, scarlet.
Shylock, Collison, scarlet.
Standard of Perfection, Keynes, crimson.
Yellow Standard, Keynes, yellow.

LACED OR SHADED, IN ALL SEVEN LISTS.

Andromeda, Collison, amber and pink.
Beauty of Hants, Oakley, shaded blush.

Beauty of Sussex, Mitchel, white and crimson.

Delight, Whale, white and purple.

Gem, Oakley, white.

Lady of the Lake, Keynes, white and crimson.

Lady St. Maur, Brown, white and lilac.

Miss Vyse, Turner, white and lilac.

Princess Radzville, Gains, white and purple.

Queen of England, Keynes, white and crimson.

Star, Bragg, white and carmine.

The fancy varieties are only given by six out of the seven parties referred to, consequently there is not one in all the seven lists. Mr. Whale does not make his return.

SELF IN SIX LISTS.

Boule de feu, Barnes, red.

SHADED AND MOTTLED IN SIX LISTS.

Marquess of Worcester, Sealey, white and pink.

FANCY VARIETIES IN SIX LISTS.

Admirable, Sealey, red and white.

Adolph Dubras, Ressequier, nankeen and white.

Jeannie Deans, Harrison, red and white.

Master George Clayton, Jeffrey, purple and white.

Mrs. Shaw Lefevre, Bragg, rose and white.

Remembrancer, Burns, red and white.

Roi des Pointes, Foreign, maroon and white.

SELFS IN FIVE LISTS.

Berryer, Turner, black.

Box, Drummond, scarlet.

Captain Warner, Girling, crimson.

Essex Triumph, Turville, black.

Minn, Drummond, rosy purple.

Scarlet Gem, Turner, scarlet.

Walter Hilson, Dodd, orange.

LACED OR MOTTLED OR SHADED IN FIVE LISTS.

Princess Royal, Hudson, amber and purple.

Sarah, Drummond, white and cherry.

FANCY VARIETIES IN FIVE LISTS.

Jenny Lind, Barnes, deep purple and white.

Madam Watchy, Foreign, violet and white.

Mimosa, Truelle, yellow and white.

Viscompte de Ressequier, Dubras, violet and white.

SELFS IN FOUR LISTS.

Golden Fleece, Union, buff.

Louis Philippe, Turner, crimson.

Marquess of Aylesbury, Whale, purple.

Mrs. Shelley, Mitchel, rosy purple.

LACED, MOTTLED, ETC. IN FOUR LISTS.

Captivation, Brown, crimson and puce.

Gloria Mundi, Headly, buff and pink.

Marquess de Perouse, Foreign, white and rose.

FANCY VARIETIES IN FOUR LISTS.

Coquette, Schmidt, rose and white.

Erherzoz Stephen, Deegen, violet and white.

Ludwig Pensel, Deegen, coral and white.

Now we bring them down to those which have only three votes out of seven: we shall state the authorities, as being more satisfactory, although we find that there are two or three errors.

SELFS.

Antagonist, white, Glenny, Whale and Spary.

Bermondsey Bee, purple, Glenny, Keynes and Spary.

Cassandra, crimson, Glenny, Whale and Spary.

Athlete, lilac, Spary and Whale.

Aurantia, orange, Spary and Whale.

Crocus, yellow, Glenny and Barnes.

Essex Rosy Lilac, lilac, Barnes and Spary.

Miss Sarah, blush, Keynes and Spary.

Mont Blanc, white, Gaines and Harrison.

Nell Gwynne, sulphur, Keynes and Barnes.

Queen of Roses, rose, Glenny and Keynes.

Queen of Sheba, blush, Glenny and Barnes.

Rosetta, rose, Barnes and Gaines.

Rose d'Amour, rose, Glenny and Barnes.

LACED OR MOTTLED, ETC.

Alexandrina, white and rose, Keynes, Barnes and Harrison.

Lady Featherstone, white and purple, Barnes, Gaines and Spary.

Alarm, white and crimson, Gaines and Harrison.

Amy, blush and pink, Keynes and Barnes.

Delicata, white and crimson, Spary and Whale.

Duncan, lemon and rose, Gaines and Harrison.

Lady Antrobus, white and purple, Glenny and Spary.

Lady Sale, yellow and red, Glenny and Keynes.

Madame Zehler, yellow and red, Keynes and Harrison.

Maid of Kent, white and rose, Glenny and Barnes.

Mary Anne, white and purple, Gaines and Harrison.

Miranda, white and rose, Spary and Whale.

Mrs. Edwards, crimson and gold, Keynes and Barnes.

Raphael, crimson and maroon, Spary and Harrison.

Royal Chancellor, shaded maroon, Whale and Harrison.

Kiln, white and lavender, Whale and Harrison.

FANCY VARIETIES.

Belladonna, red and white, Glenn, Barnes and Harrison.

Belted Knight, buff and orange, Glenn, Keynes and Barnes.

Elegans, crimson and white, Barnes, Gaines and Spary.

Florence Dombey, yellow and white, Keynes, Barnes and Harrison.

Hermione, red and white, Glenn, Keynes and Spary.

Madame Wallner, black and white, Gaines, Spary and Harrison.

Minerva, buff and white, Glenn, Gaines and Harrison.

Surprise, crimson and white, Glenn, Gaines and Spary.

Empereur de Maroc, black and white, Barnes and Harrison.

Eveque de Dijon, Foreign, Keynes and Gaines.

Lady Sale, yellow and white, Glenn and Harrison.

Madame Chauviere, rose and white, Glenn and Keynes.

Miss Peel, crimson and blush, Glenn and Harrison.

Miss Watson, purple and white, Barnes and Spary.

Narcissus, crimson and white, Keynes and Harrison.

Ober von Werlhoff, brown and white, Gaines and Spary.

Queen of the French, yellow and white, Glenn and Keynes.

Robin Hood, scarlet and white, Glenn and Barnes.

In obtaining these lists there has been some misunderstanding, but of no great consequence. For instance, the class called laced or shaded Dahlias was understood by some to mean only white, yellow or buff, or at least light grounds, and each was requested to give a list of the best twenty-four. Those therefore who looked at this class as a light one, confined themselves to those, and had to put in very bad flowers to make up twenty-four at all. Who, for instance, could treat such flowers as Raphael, as belonging to the same class as Miss Vyse, Star, Queen of England, &c. Again, the number was too great to get the best. No good judge of Dahlias could find twenty-four selfs, without putting in his list flowers that he would not grow. But this plan, adopted in the *Horticultural Journal* and *Gardener's Gazette* many years since, is, with proper allowance for the circumstances,

a very good guide. It is, however, a bad plan to admit the new flowers into lists of this sort. A man is not a judge of his own new flowers, he cannot see their faults, and moreover will not believe any body who points them out. There is a sort of prepossession which nobody can get over. They have seen their flowers growing until their eye is accustomed to their blemishes, which become less and less important as they become familiar; but the judge who is looking on can see them, and in vain may he endeavour to persuade a grower he overrates his bantling. Besides this, some men in making out a list of the best twenty-four flowers of any kind, will shrink from inserting their own new ones, while others think it a capital opportunity of giving them a fair lift into notice. Again, many of those who are quite familiar with all the old favourite flowers, have not had an opportunity of seeing all the new ones, and as they can only give an opinion on those they have seen, it follows that such a return would not be all that is required, though to a certain extent it would be useful. Mr. Glenn stands alone in several flowers, whether, feeling compelled to give twenty-four, he has gone to the very middling ones to make up the number, or that he still thinks well of the varieties in question, is not to be gathered from any thing that appears, but he gives the Bohemian Girl, Holme's Exquisite, and Glorie de Dahlias. As instances of a man being obliged to recommend his own flowers, we have Mr. Gaines alone in his Achbar, with only one solitary helpmate with his Mont Blanc, and alone with his Countess of Zetland. Whale is alone with his Matchless, Spary alone with his Cassiope, Harrison with his Circe; and many other instances might be adduced to show the impropriety of adding the new ones to a list of this kind. However, considering that some thousands of pounds change hands every year for this flower, we may be allowed to devote the space necessary for this imperfect, though to some extent useful, evidence of the quality of some of the leading sorts. We wish some of those amateurs who have no interest whatever in the sale of such things, would favour us occasionally with their notions of the best florist's flowers and plants; for they would be a surer guide than dealers, and it must be recollected that in the foregoing authorities there is but one totally disinterested.

THE PROPERTIES OF THE TULIP.

We observe that a writer in a contemporary work that we do not see, but which has been quoted in the *Gardener's Chronicle*, affects to have made some discovery as

to the properties of the tulip, and takes some pains to detract from the merit of the author of the *Properties of Flowers*. The *Gardeners' Chronicle*, too, in quoting it, seems to favour the notion that there was something new in the writer's proportion. It is our business to remind the readers of that work, and the editor of the *Chronicle*, that until Mr. Glenny laid it down that a tulip ought to be a portion of a hollow ball, (no matter what portion—we will not go into that now,) no writer ever ventured to hint at such a form, and, therefore, that the author of the *Properties of Flowers* has a just title to the origin of the only sound principle upon which any proposed form was founded. Secondly, we wish to correct the writer in one very extraordinary proposition, namely, that to form half a ball a petal must be longer than it must to form a third of a ball. The same flower that forms half will, with a little additional heat, expand until it forms a third; the same petals, the same flower that forms a com-

plete half globe, forms, when a trifle expanded by the sun, a third; and not all the sophistry in the world shall persuade us that the identical same flower is not equally beautiful in all its stages, from the time it is half, until the influence of the sun shall in mid-day bring it down; for it forms the third of a larger globe than it forms the half of when closer, and what it loses one way it gains another. But it is a strange thing that there is a perpetual itching on the part of many florists to detract from the author of the *Properties of Flowers*, and to claim merit for originating what none but that perfectly original writer originated himself, and what nobody can fairly take away from him. If, however, he thinks the writer worthy of further notice, we leave him in Mr. Glenny's hands, for we have only set the writer correct upon the fact that Mr. Glenny was the originator of the first word that was written about the tulip forming part of a hollow globe.—ED.



THE GEOLOGY AND BOTANY OF THE LIZARD.*

THE Rev. Mr. Johns possesses a faculty of making something out of nothing: in other words, he contrives to excite an extraordinary degree of interest without any other foundation than materials so slight that we seem to wonder by what means he renders them capable of sustaining the weight of his super-

structure. If, then, with the help of a few weeds he can produce such works as his "*Botanical Rambles*," what may we not expect when he has really something substantial to begin with? The coast of Cornwall, rich in geological wonders, and redolent of historical and romantic interest, presents to his searching genius a wide field for employment; and, accordingly, selecting a small spot at the extreme point of the county for a few days of exploration, he has favoured us with a volume

* A Week at the Lizard. By the Author of "*Botanical Rambles*," "*Forest Trees of Britain*," &c. London: Published by the Society for Promoting Christian Knowledge. 1848.

of the most exciting character, yet containing merely a journal, entitled *A Week at the Lizard*. Such, however, is the magic of his pen, that an incident which in an ordinary traveller's hand would be the most simple and unmoving of all tame events, engages one's attention as a matter of importance, invested as it is with the deep interest which the learned author gives to everything he touches. But when he records anything that is of itself commanding, it is by his power of description wrought up to a mighty reality. The scene, the circumstance, the details are before us in such vivid colours, that we cannot help partaking with him the joy, the fear, or gratification, as the case may be, as if we were his very self. Let us take one instance:—

"The tide was out as I expected; I accordingly began at once to explore for Asparagus Island, which, with the imperfect description I had received, I had no difficulty in recognising in a high detached rock to the right of the cove, the top of which was covered with vegetation. I soon climbed to the summit in search of asparagus, but failed, for the simple reason that it does not grow there. I was, however, well pleased to discover the tree-mallow, which I had never before seen growing wild. A few specimens of this I secured and laid out in my book to dry. All this occupied some time, and on my descent I found that the tide had begun to flow, and that my retreat to the cove was cut off, unless I chose to wade through the water to the depth of about a foot. I quietly took a survey of the cliff, and seeing that it was (as I imagined) easy of ascent, I thought I need not be in a hurry, but might as well rest myself after my eleven miles' walk, and discuss my sandwiches. This done, I began to mount the cliff, and at first made a rapid progress, there being plenty of grass as a holdfast for my hands, and of loose stones among which to insert my feet. But when I had ascended some sixty feet, I found myself stopped by a slanting sheet of polished serpentine, on which I could gain no footing, though I made several attempts. I accordingly descended, with the intention of making a trial somewhere else, and proceeded yet further to the right. But here I found myself entirely at fault, the sea having come in to the very base of the rocks, which were perpendicular. My only alternative was to turn back and regain the cove by wading through the water. I found, however, that I had spent so much time in my ineffectual effort to scale the cliff, that the tide had risen considerably, and I could not now attempt to ford a passage without incurring great danger, and reluctantly came to the con-

clusion that I was in an awkward predicament. The tide had still four hours to flow, so that I should of course be detained ten or eleven hours. To add to my discomfort, it seemed to be on the point of raining; and re-collecting with what difficulty I had found my way out by daylight, I could not lose sight of the fact that it would be yet more difficult to find my way home by night. Yet I had nothing to do but to sit still and wait, a task which I tried very hard to perform, and took from my pocket Johnson's 'Rasselas,' in the hope of whiling away the time. I soon found that the 'History of a search after Happiness' was little suited to the frame of mind to which I was then subjected, and quickly shut my book. As for sitting idle, it was quite out of the question; so I again climbed the island to explore, but discovered nothing to justify the hope of improving my condition. The only point where there appeared the least probability of the ascent being made by a human being was that which I had tried and found impracticable. I again descended, scrambled over the rocks to the right and left as far as the tide would allow me, sat down and endeavoured to compose my mind. Danger there was none, the island being large enough to afford refuge to a hundred men, and I knew very well, from the character of the vegetation on the summit of the rock, that it was never swept by the sea, even in the stormiest weather. An hour and a half I spent in this way, and at last, in spite of all my efforts, had worked myself up to such a pitch of excitement, by picturing to myself the misery of sitting ten or eleven hours in the rain, climbing over the rocks in the dark, and finally groping my way over an unknown country, with whatever vigour of body and mind that I had possessed exhausted, that I resolved to make a fresh attempt where I had before been unsuccessful. I recollected that when I made the first trial, I thought there were many other ways of ascending, and that I might therefore have been deterred by difficulties which, in my present emergency, would not seem so formidable. I accordingly began the ascent a second time, and in a bolder spirit. When I reached the shelving mass of rock mentioned above, I stopped to take breath, and to meditate once more whether the personal inconvenience of spending the night on the spot, and the anxious suspense which my absence would occasion my friends, were sufficient to weigh against the risk I might incur in persisting in my attempt. I had all but decided on returning, when I observed a small stone in a crack of the rock, which appeared to be loose; this I removed, and thus obtained one footstep, but not being satisfied with my precarious footing, resolved

on desisting at once. To my utter horror I found this to be impracticable. The book which I had slung across my back so impeded my movements, that when I attempted to turn, the corner pressed against the cliff and forced me outwards, and had I persisted, would inevitably have precipitated me to the bottom. I could not retain my posture for any length of time, resting as I was on one foot, and being obliged to hold fast with one hand in order to do even that; my only alternative was to proceed, but whither, I knew not. By occasionally making use of my stick to loosen some stones, and to try the strength of others, which frequently peeled off from the rock with a very slight pressure, I contrived to approach within eight or nine feet of the top. Here, however, I found myself in a situation in which few I believe have ever been placed, except in the most terrific dreams. I had gradually quitted that part of the rock which hung over the sloping grass; I had inserted the end of my stick in a crevice, and, being obliged to use both hands in clinging to the rock, I could not draw it out, and if my foot had slipped I should have glided over a few feet of smooth stone, and then fallen seventy or eighty feet, whether into the sea, or on the shore, I could not turn my head to examine. To add to my distress I found my book much in my way; I was supported almost entirely by the muscular strength of my fingers, and a mass of apparently loose stones projected over my head. These I must surmount, but how? The only possible support for my feet was six feet below the summit of the rock, and not more than half an inch wide. I managed with great difficulty to set my foot on this, snatched at, and caught hold of, the top of the rock with the ends of my fingers, and was suspended, as it were, between heaven and earth, directly over the precipice, when—the ledge under my feet gave way, or my foot slipped (terror prevented me from observing which)—with strength more than natural, I clung by my hands alone; I felt a shudder pass through my frame—my blood seemed to stagnate, and a spontaneous agitation of all the nerves in my body commenced, so violent, that this new horror now took possession of me, that the involuntary motion of my hands might loosen my hold. During what appeared to me a long time, but what I dare say was, in reality, less time than my readers take in following my description, was I in this state, dangling my feet on every side in search of a resting-place, and dreading lest the stones to which I clung with my fingers, should give way. Feeling that I could hold no longer by my fingers, I made a violent effort, and planted my knee, I know not how, just below my hands; still I was not safe; I was now

balanced on my hands and one knee on the edge of a cliff, one leg was still hanging over idle, and my book, which I had not the means of getting rid of, had slipped round in front, and inserted itself between my body and the rock. By dint of another effort, however, I contrived to throw myself forward, and was safe! But, alas, I had not yet reached the top, I was scarcely half-way up; but I was resting at full length on a plot of green turf—the scene of as earnest thanksgiving as had ever been poured forth from my heart—and though I was for some time in such a state of nervous excitement that I dared not look down, much less venture to move, yet the consciousness of imminent danger was gone, and with it all anxiety. Still my limbs were in a trembling state, my tongue was glued to my palate, and though I tried to swallow a little brandy, my throat refused to perform its office; all that I could do was to rinse out my mouth, and to long, as earnestly as a traveller in the desert, for a draught of water that I might do so effectually. I had not even yet accomplished all my task; a large portion of cliff still remained to be surmounted, scarcely, if at all, less precipitous than that which I had traversed. I was resolved, however, to run no more risk, and sat down calculating the probabilities of my being seen and rescued on the next day by a large party, who I knew were coming hither for a day's enjoyment from Helston. After resting a little while, though I had not yet mustered sufficient nerve to look down, I began to explore my position, and saw behind me a low, but steep rock, which, not being very difficult, I ascended, and to my infinite joy, discovered just before me a pathway worn by human feet, leading by a circuitous route from some part of the coast now covered by the sea to the summit of the cliff. It may readily be supposed that I was not long in reaching this. I ran, as well as the nature of the ground would permit, and soon reached the top; and now that I once more had the power of walking on level ground, all that I had before experienced seemed a dream; but the roaring of the waves beneath me, which I dared not, even then, look down upon; the quivering of my limbs, and, above all, the tears of grateful emotion which involuntarily rose to my eyes, soon convinced me of the reality of my situation, and of my perilous expedition."—Pp. 130—140.

If the reader has recovered breath after his effort to finish this narrative, we will proceed to notice less fearful matters; but the feature that should be foremost now is the magnificent scenery which is brought before us, with numerous finely-executed engravings, abounding in lessons for the construction of

rock-work, and especially adapted to the study of the landscape gardener,—lessons that will convince the most careless observer of the frivolity of the notions hitherto formed by the designers of this kind of erections, even of the trumpery character of those last attempts, in the midst of the fashionable world, under the very noses of royalty and nobility, the rock-work in the Regent's-park. Not that we are so outrageous in our wants as to require the bold scenery of the coast of Cornwall in a little botanical garden, but that we regret the very minute minds of those entrusted with "national concerns," which are correspondingly frittered away into infantile imitations of gigantic deformities. We can hardly conceive anything in better taste than the plan of this work. The description of the most interesting portion of the most interesting coast, with many excellent representations of rocky scenery, which give us the best insight into the structure of artificial rockwork, is no small boon to a class of men who have treated such subjects in British gardens as toys, and totally lost sight of the aim and object of landscape gardening. We have repeatedly condemned the ridiculously-small specimens of rock-work in this country. Rock-work has no more right to be introduced on a scale too small to be natural than a road has to be made too narrow for carriage-wheels. And be it remembered, that this diminutiveness is not so dependent on the measurement as upon the plan of the subject, because a single stone, or heap of stones, with all the appearance of part of a natural rock obtruding through the soil, may be made as small as it is possible to want it, and not be in itself unnatural; but a pretended piece of rocky scenery, with hardly a piece larger than a good brick, and an archway that a tall man may knock his head against, is an absurdity. How much more absurd is it, when half-a-dozen of these toy-like features obtrude themselves in a concern so limited that they are in sight of one another. The same expense given to one worthy bit of rock scenery might have been a credit instead of a stain upon our national taste. We hope, however, most ardently that foreigners do not look upon our parks and public gardens as specimens of English taste, while they are, in reality, nothing but evidence of the facilities with which ignorant pretenders can get employed, to the exclusion of men worthy of such employment. But we must not lose sight of our author at the Lizard, where he accompanies the poor fishermen in their avocations one day, explores caverns another, and, in one case, where we should not like to follow him. He has already related the story of two other gentlemen's adventure there in

search of thieves, and one of these parties is his companion now.

"Somewhat about half-way between Kynance and the Rill, is an almost inaccessible cave, which was formerly frequented by a desperate gang of sheep-stealers. It became generally known in the following way :—The lieutenant of the coast-guard stationed at Cadgwith received a letter from head-quarters, directing him to proceed with a party of his men and examine a certain cave, the exact position of which was described, information having been received that in it was secreted a large quantity of smuggled goods. After much search, the mouth of the cave was discovered, almost concealed by a mass of fallen rock. Here the officer produced his letter, and having read it to his men, asked who would volunteer to enter first. No one replied. The entrance to this robbers' den was about two feet in diameter, and it was evident that if there were but one resolute fellow within, he might, armed only with a pen-knife, keep at bay a whole army. The officer, a man of dauntless courage, accordingly led the way himself, as indeed he had all the while intended to do, and was followed by his men. The cave, however, was unoccupied, and nothing was found but a sheep-skin and some scraps of leather, proving that it had been visited by a sheep-stealer, and by some one who chose to exercise here the business of a shoemaker.

"The same gentleman afterwards related to me this account of his unsuccessful search. He one day also took me to the place. We were obliged to scramble down the face of the cliff, which was composed principally of large loose stones, affording a very insecure footing, and when arrived at the bottom, he led me a short distance over the same kind of ground, until, suddenly stopping, he said, 'You are now within six feet of the mouth of the cave.' He then pointed it out to me behind a mass of rock, and as I felt no inclination to accept his polite offer of going first, he lay down flat, with his hands above his head, and wriggled himself in. This uncomfortable posture I found, when I proceeded to follow him, was quite necessary, the aperture being too narrow to allow the arms to remain by the sides, and too low to admit of a kneeling posture. After a few feet of this serpent-like progress, I was enabled to stand upright, and found myself, to my great astonishment, in a lofty and extensive cavern, perfectly well lighted by the rays of the sun, which were streaming in through a narrow fissure, extending for many feet along the roof of the cave. We found no relics of former inhabitants, and I, having heard of the desperate character of its

late tenants, did not care to explore the recesses. When we had seen enough, we withdrew, assuming the same ignoble posture as when we entered, and I felt not at all sorry that it was now my turn to go first. Since the above visit I have often searched for the 'Sheep-stealer's cave,' but I could never discover it, nor, strange to say, have I ever since fallen in with any one who either could or would direct me to it."—Pp. 108—110.

We have an enormous objection to even stooping to get into a cave, but the idea of lying down and having to scramble or crawl in is frightful. Mr. Johns gives us some excellent descriptions of the geological nature of the coast, worthy of attention; and the appendix, which, like the postscript of a lady's letter, will be thought by many the most important portion of the work, is devoted to the botany of the coast; and here the publishers—"the Society for the Promotion of Christian Knowledge"—have been lavish of embellishments, of which there are nearly thirty devoted to the vegetation selected for notice. With a few of these notices we shall close our review.

"The great characteristic feature in the botany of the district, is the extreme abundance of the Cornish or Goonhilly Heath. It may be said to grow over the whole country from Mullion to the Blackhead, except where it has been extirpated by the plough. Every hedge-bank and road-side is full of it, and if we enter the cottages, turf composed of it, mixed with smaller plants, is the only fuel. Near the verge of the cliffs, most of the plants are either different from those which we meet with inland, or their character is altered by exposure to an atmosphere charged with salt. Thus we find common groundsel and eye-bright with thick fleshy leaves and stems but little branched; the ox-eye daisy and sheep's scabious, diminished to the height of a few inches, and likewise furnished with fleshy leaves and stems. The rare and otherwise interesting plants are numerous."—Pp. 269, 270.

"The furze and heath are greatly infested by *Cuscuta Epithymum*, Lesser Dodder, a parasitical plant, composed of innumerable red threads, which are firmly attached to the stems of the plant on which it grows, and almost conceal it from sight. It is destitute of leaves, but bears heads of beautiful wax-like flowers of a light pinkish hue.

Corrigiola littoralis, Strapwort, is a very pretty little plant, with slender trailing branches from three to six inches in length, which grows among the shingle on various parts of the shore of the Loe Pool. It may be distinguished by its narrow glaucous leaves,

and numerous heads of minute white flowers; it is remarkable for possessing the singular habit of shifting its habitat from one part of the shore to another, almost every year. Some-



Cuscuta Epithymum.

times, for instance, it abounds in the slaty beach at Penrose, but scarcely a single specimen is to be found on the opposite side of the lake; next year, perhaps, it grows in profusion on the eastern beaches, but has disappeared from its former station. It is rarely to be found in equal abundance on all parts of the shore. This wandering habit may thus be accounted for:—it is an annual, and always grows in situations which in winter are covered by the water. As the latter rises, it buoys up the seeds on the surface, and they are driven by the wind in whatever direction it may be blowing, until they are thrown on the opposite shore. In the following season the plants abound on the side opposite to that from which the wind was blowing when the water rose. The Strapwort grows nowhere in Britain but here and in two places in Devonshire."—Pp. 272—274.

"The turf on the verge of the cliff for many miles of this coast is, in spring, studded with countless sky-blue star-like flowers of *Scilla verna*, Vernal Squill, a lowly unpretending plant, which, though of delicate texture and elegant form, makes its home in the most exposed situations. No British flower

confers a greater grace on its haunts than this. Its only fault is, that it remains in blossom only during a few weeks in May and June; before Midsummer it has disappeared, its place being occupied by its three-celled seed-vessels, which are conspicuous even after they have been dried up and bleached by the sun, and have shed the black shining seeds which they contained. In the months of August and September, *Scilla autumnalis*, Autumnal Squill, a plant very like the vernal species, but much less beautiful, comes into flower here and there along the coast, but is nowhere, except at Cudden Point, so abundant as to form a distinct botanical feature. Its flowers are more pyramidal in their mode of growth, and of a dingy hue. The leaves do not appear until the flowers have faded. Its bulbs are so tenacious of life that I have frequently stored away specimens in flower, and, on examining them some weeks after, found the petals faded, but new leaves shooting out most vigorously.

"At the sandy base of the cliff which skirts the Loe Bar, occurs *Convolvulus Soldanella*,



Convolvulus Soldanella.

Sea Bindweed. It may readily be detected by its fleshy leaves and large handsome flowers, which are scarcely elevated above the surface of the sand. The latter only expand in bright weather, and are of very short duration; they are light pink, with darker stripes of the same colour, and are so delicate that they will scarcely bear being gathered without becoming ragged at the edges.

Eryngium maritimum, Sea Holly, sends its long cylindrical roots deep into the sand of

the Bar; it has much of the character of a thistle, but in reality is one of the umbelliferous tribe. It is well marked by its stout prickly leaves, and purplish blue heads of flowers; the whole plant is covered with a glaucous or bluish-white bloom, which identifies the plant, even if seen from a great distance. Its roots are made into a sweetmeat, which is well known under the name of 'candied Eryngo-root.'—Pp. 278—282.

"Cornwall is remarkably rich in minute flowering plants, which inhabit wet places, and most of which are either unknown or far from common in the more eastern counties. *Sibthorpia europæa*, Cornish Money-wort, with its trailing thread-like stems, beset with orbicular notched leaves and tiny flesh-coloured flowers, clothes the sides of every trickling rill; and with it is usually associated *Campanula hederacea*, Ivy-leaved Bell flower, a lovely little plant, with a stem almost as fine as a hair, and so frail, that were it not for the assistance rendered by its stouter neighbours, it could scarcely raise its filmy blue-bell above an inch from the ground. Where these two grow, we may reckon with certainty on finding the commoner, but scarcely less beautiful, *Anagallis tenella*, Bog Pimpernel, with its creeping wreaths of shining round leaves and rose-coloured flowers. A more lovely sisterhood of fairy flowers can scarcely be imagined. *Pinguicula lusitanica*, Pale Butterwort, is another minute but elegant plant, with pale pink blossoms shaped somewhat like the violet, and supported singly on a slight perpendicular stalk about three inches high. The flower-stalks rise from a tuft of greenish-white leaves, singularly veined, and greasy to the touch, whence it derives its name. Its roots are so small as scarcely to attach the plant to the spongy soil in which it delights to grow. *Centunculus minimus*, Small Chaff-weed, frequents the gravelly banks in the neighbourhood of marshes, and closely resembles a Pimpernel in habit; it rarely exceeds an inch in height. *Radiola millegrana*, Flax-seed, grows in similar situations, and attains an equal elevation; it is much more slender and more minutely formed than the last, and, being repeatedly branched and thickly-loaded with leaves and flowers, has the habit of a perfect shrub."—Pp. 286—289.

"In Degibna Wood, *Erica vagans*, Cornish Heath, is abundant and flowers freely, though it does not here reach a size equal to that which it attains on the serpentine formation. It is botanically distinguished from the other British Heaths, by its anthers forming a ring outside the bell-shaped corolla. *Erica ciliaris*, Ciliated Heath, the most beautiful British species, confines itself to Cornwall, like the last, but does not grow in the Lizard district.

"Continuing our way round the coast, we pass the Halzaphron Cliffs, and, on the promontory beyond, fall in with *Genista tinctoria* β . *prostrata*, Dyer's Greenweed, a low shrubby plant, with numerous clusters of bright yellow flowers. All parts of this plant furnish a good yellow dye. *Genista anglica*, Needle Green-weed, grows on many parts of

the Lizard and Goonhilly Downs. It is well marked by its inflated seed-vessels, and by having the lower part of its stems clothed with slender thorns. In the course of drying, its petals turn to a lurid green. *Genista pilosa*, Hairy Green-weed, a much rarer species than either of the above, grows at intervals along the cliffs. It is distinguished by its



Erica Tetralix, Ciliaris, Vagans, and Cinerea.

humbler mode of growth, knotty wooded stems, and silky leaves, which are folded together. It blossoms in May, and, if the summer be not too dry, again in September. *Genista tinctoria*, the first-mentioned species, is abundant on many parts of the Lizard coast, flowering from June to the end of August.

"On the same promontory, somewhat more inland, grows *Ophioglossum vulgatum*, Adder's-tongue, a remarkable fern, consisting of a single undivided egg-shaped leaf, from the base of which rises a tapering spike of fructification marked like the tail, rather than the tongue, of a snake. It is not easily detected, owing to its uniform green hue, and its growing in a turf composed of plants about the same size with itself.

"In the cornfields about Gunwalloe, grow several plants which, though not peculiar to the district, are sufficiently rare to merit notice. *Briza minor*, Small Quaking-grass, is one of the most elegant of the British grasses. The stem is about two feet high, and bears a profusion of small triangular spikelets, each of which is placed at the extremity of a stalk so fine as to be barely visible, and dances to the music of the lightest

breath of heaven. The specimen now before me contains about five hundred of these spikelets, each of which is about seven-flowered; so that the total number of flowers on one stalk is no less than three thousand, and there are often four or five such stems springing from a single root. If gathered before the seeds are quite ripe, this beautiful grass retains its shape and silver-green hue for a long time, and if protected from dust, forms an elegant addition to bouquets of winter flowers."—Pp. 290—293.

"On the rocks adjoining Gunwalloe church, grows *Statice spathulata*, Sea Lavender, a pretty plant, with glaucous leaves and branched spikes of purplish blue flowers. After these have disappeared, the seeds tipped by the transparent membranous calyx long remain conspicuous, and retain their ornamental appearance for a considerable time after the flower-stalk has been gathered."—Pp. 298, 299.

"*Comarum palustre*, Marsh Cinquefoil, will be at once distinguished by its large brownish purple flowers and serrated leaves, which, as the name indicates, grow with five leaflets on a stalk."—P. 300.

"*Asparagus officinalis*, Common Asparagus, grows in great abundance in the clefts of the rocks under the Rill, on the island at Kynance,



Statice spathula and Armeria.

to which it gives name, and in a ravine a few hundred yards north-east of Cadgwith Cove. It is in all respects like the Asparagus of our gardens, and at the last-mentioned place is treated as a culinary vegetable. Though always remarkable for its elegant mode of growth, in autumn it is particularly ornamental, owing to the contrast to the vegetation around it, afforded by its brilliant yellow foliage and scarlet berries."—Pp. 308, 309.

"A sloping bank on the right hand side of Caerthillian valley, about a hundred yards from the sea, produces, I should think, more botanical rarities than any other spot of equal dimensions in Great Britain. Here are crowded together, in so small a space that I actually covered with my hat growing specimens of all together, *Lotus hispidus*, *Trifolium Bocconi*, *T. Molinieri*, and *T. strictum*. The first of these is far from common; the others grow nowhere else in Great Britain; *T. Bocconi* and *T. Molinieri*, were first observed about ten years ago; the former may be distinguished by its terminal heads of flowers, which always grow in pairs; it occurs also on a hedge near Cadgwith, and on a rocky mound between that place and Poltesco. *T. Molinieri* occurs at intervals between this spot and Cadgwith flag-staff; it is easily detected by its large star-like heads of downy flowers, which, as the seeds begin to ripen, assume a remarkable whitish hue. *T. strictum* I had the good fortune to discover in July 1847, here and

near the Old Lizard Head. It is strongly marked by its erect habit, long serrated leaflets, and globular rigid heads of flowers. It was previously known as a native of Jersey, but had not been noticed in Great Britain.

"The fact that three species of Trefoil peculiar to the district should have been discovered growing together, has been thought so singular, that some botanists have entertained doubts whether they are really indigenous. I myself see no reason to doubt that their first introduction to the Lizard district was coeval with that of the rest of the vegetation on the cliffs. It should be remembered, that as the Lizard is the most southerly point in England, and its climate uniformly mild, we have good grounds for expecting to find plants properly belonging to the warmer sea-coasts of Europe, and such is the case with these three Trefoils; they are all found on the coast of the Mediterranean."—P. 312.

"Among the rocks under the Hot Point, the beautiful fern, *Asplenium lanceolatum*, Lanceolate Spleenwort, attains a size much larger than I have ever seen it elsewhere. *A. marinum*, Sea Spleenwort, is common all along the coast; its favourite haunts are caves, the roofs of which are beyond the reach of the sea-water. In Ravens' Bay it grows



Comarum palustre.

most luxuriantly, and within reach."—P. 317.

"Near Kynance, on the Balk, near Cadwith, and especially on the sandy cliffs at Kennack, we meet with a singular-looking plant, which in its young state resembles a shoot of *Asparagus*; when in perfection, it is a reddish-brown, scaly, viscid stem, with ringent or gaping flowers of nearly the same colour, but entirely destitute of leaves. On pulling it up, we find that the stem terminates below in a solid scaly knob, with a few rootlets. This is *Orobanche rubra*, Red Broom-

rape, one of a genus of plants which are parasitic on the roots of various others, such as Broom, Furze, Clover, Ivy, Carrot, &c. This species is found only on Basaltic and other rocks which appear to be volcanic in their origin. I am inclined to think that it is parasitic on the roots of wild Thyme, but am by no means certain. It grows also on basaltic rocks at the Giant's Causeway and at Staffa."—Pp. 317, 318.

We have made these extracts without re-



Trefoils.

gard to order, and, indeed, without preference. They are fair specimens of the work throughout, and show us not only Mr. Johns' power of clothing the veriest trifles with interest, but his aptness at discovering all the most interesting subjects that he approaches. Of him it may indeed be said that he finds

"Sermons in stones, lessons in running streams,
Good in every thing."

Scientifically reviewed, the work does not invite criticism. As we have already shown, science with all its technicalities are thrown overboard; he has a happy way of describing

things minutely without such aid; and though possessed of all the qualifications for treating of botanical subjects with all the professional jargon, he abjures it—and yet no one can read his description of botanical peculiarities belonging to a plant, without being thoroughly acquainted with its structure.

In conclusion, we cordially recommend the lovers of botany, geology, and of the picturesque, to place this volume, among the most interesting of its class, upon the shelves of their libraries: it is not enough merely to read it.

NEW FLOWERS AND PLANTS.

ZAUSCHNERIA CALIFORNICA, *Presl* (Californian *Zauschneria*).—*Onagraceæ* § *Epilobææ*.—A beautiful herbaceous perennial, growing about three feet high, of a much branched habit, and having a very ornamental character. The leaves are sessile on the stem, and of an ovate form, with the margin slightly toothed. The flowers are produced singly from the axils

of the leaves near the tips of all the numerous branches; they assume a nearly horizontal position, and are about an inch and a half in length, the calyx being tubular and cleft at the apex into four acutely triangular segments, and the corolla formed of four inversely heart-shaped petals which are nearly flat; the colour of these parts is scarlet, as is also that of the

stamens and four-lobed stigma, which project considerably beyond the corolla. Native of California, in fields near Santa Cruz. Introduced in 1847. Flowers throughout the summer season. *Culture*.—Hardy; good garden soil; propagated easily by cuttings or by seeds.

RHODODENDRON NILAGIRICUM, *Zenker* (Nilgherry Rhododendron).—*Ericaceæ* § *Rhododendrea*.—This is an exceedingly fine tree Rhododendron, having a similar habit to the *Rhododendron arboreum*, but differing in various particulars. The leaves of this species are oblong-lanceolate in form, with an acute point, and they are leathery in texture, the lower surface being densely covered with loose ferruginous tomentum or down. The flowers form a large and almost globular head terminating the shoots; the individual blossoms are large, of a delicate and not very deep rose colour with a pale lemon centre, and dotted with numerous small dark spots. The species varies in the hue of the flowers from deep crimson to rose colour, and a white flowered plant which has been referred to *Rhododendron arboreum*, is perhaps also a state of this species. Native of the East Indies on the Nepal and Nilgherry hills. Introduced about 1844 by Messrs. Lucombe, Pince and Co., of Exeter. Flowers in April. *Culture*.—Hardy; peat and turfy loam; propagated by grafting or inarching or by layers.

RHODODENDRON BARBATUM, *Wallich* (bearded Rhododendron).—*Ericaceæ* § *Rhododendrea*. A splendid and very distinct species of Rhododendron of arborescent habit, having the young branches, peduncles, and fruit clothed with long stiff glandular hairs or bristles. The leaves are large, broadly lanceolate, leathery in texture, and having a glossy surface; and the flowers are produced in a very close and compact head: the individual blossoms are remarkably regular in form, the segments being nearly or quite equal, and the outline perfectly circular; the colour is a rich bright rosy red. Native of Nepal. Introduced about 1840 by Messrs. Dickson of Chester. Flowers in April and May. This is not the *Rhododendron barbatum* of Don, but is Don's *R. setosum*. *Culture*.—Hardy; peat and turfy loam; propagated by grafting, or inarching, or by layers.

VRIESIA SPECIOSA, *Hooker* (showy Vriesia).—*Bromeliaceæ*.—A beautiful perennial, with the habit of the pine-apple plant; that is to say, with a circle of leaves rising from the root, long, narrowish, and somewhat concave, dark green, and marked with black transverse bands. The flower scape issues from the centre of these leaves, and grows erect a foot and a half long; it is terminated by a compact spike of flowers arranged in two rows,

one on each side the stem; this spike is composed of numerous lance-shaped closely overlapping bracts of a rich scarlet colour, which constitute the great beauty of the plant; from each of these bracts issues one white flower formed of three linear-spathulate petals. Native country not stated. Received at Kew from the Jardin des Plantes at Paris, about 1846. Flowers in winter. It is the *Tillandsia splendens* of the French gardens. *Culture*.—Requires a stove; light turfy peat; propagated by division of the plant.

TETRAZYGIA ELEAGNOIDES, *De Candolle* (Eleagnus-like Tetrazygia).—*Melastomaceæ* § *Melastomeæ-Miconiæ*.—A shrubby plant of branching habit, with opposite oblong-ovate leaves, sharply acuminate, three-nerved, dark green above, and beneath as well as on the petioles peduncles and calyx coated with small silvery scales, which impart to these parts a white appearance. The flowers are white, and grow in terminal panicles; in the centre is a tuft of conspicuous yellow stamens. Native of the West Indies. Introduced in 1845. Flowers in March. It is the *Melastoma eleagnoides* (Swartz). *Culture*.—Requires a stove; loam and peat; propagated by cuttings planted in sand in a hotbed.

ACACIA ARGYROPHYLLA, *Hooker* (silver-leaved Acacia).—*Fabaceæ* § *Mimoseæ-Acaciæ*.—A very beautiful shrub, growing rather tall, with erectish or somewhat spreading branches which are angled, and in the young state silky. These branches bear phyllodia from an inch and a half to two inches and a half long, of an obovate-oblong form, obtuse and pointless, and clothed on both sides with compact silvery down, like a glossy silky cobweb. The flowers grow in globose heads, sometimes solitary and at other times in short racemes from the axils of the phyllodes; they are deep rich yellow, and produced abundantly all over the plants, rendering it an exceedingly ornamental species. Native of the Swan River settlement, in Australia. Introduced about 1845. Flowers in April. *Culture*.—Requires a greenhouse; loam and peat; propagated by seeds or cuttings.

TROPÆOLUM SMITHII, *De Candolle* (Sir J. Smith's Nasturtium).—*Tropæolaceæ* § *Tropæoleæ*.—A free growing climbing plant, apparently annual, having the habit of the "Canary-bird flower," *Tropæolum aduncum*. It is smooth in every part, and has twining succulent stems and peltate leaves, palmately five-lobed, with oblong or lanceolate lobes; they are attached by long slender cirriform petioles. The flowers are axillary and solitary, the calyx of a dull brick red terminating behind in a long nearly straight green-tipped spur, and the corolla of five orange petals, all toothed and fringed, the fringe and veins

being red ; the two upper petals are small and sessile, the three lower ones largest and unguiculate. It is well adapted for growing as a summer climber in company with the yellow-flowered *T. aduncum*. Native of the high mountains of Columbia as at Lloa, 9,000 feet above the sea. Introduced in 1847. Flowers throughout the summer. *Culture*.—Half-hardy ; common garden soil ; propagated by seeds or cuttings.

NORDMANNIA CORDIFOLIA, *Fischer and Meyer* (heart-leaved Nordmannia).—Thymelacææ.—A pretty perennial herb growing ten inches or a foot high, with cordate leaves springing from the root, and an upright stem bearing short branches of flowers, which are of a purplish colour, and interesting from the peculiar twisting of the petals. Native of China. Introduced in 1846. Flowers in March. *Culture*.—Half-hardy ; peat and loam ; propagated by dividing the plant. It is said to be a good forcing plant, and hardy enough for culture in a dry sheltered border.

PÆONIA MOUTAN atropurpurea (dark purple Tree Pæony).—Ranunculacææ § Helleboreæ.—A desirable and distinct variety of vigorous growth, having deep green foliage with little red, and flowers nearly single, with from six to eight petals, and a few small ones in the centre ; the colour is deep purple when full blown, but having a decided lilac tint when younger. Native of China. Introduced by Mr. Fortune in 1846. Flowers in May. *Culture*.—Nearly hardy ; rich sandy loam ; propagated by grafting on the roots of *P. albiflora*, and others, or by division.

PÆONIA MOUTAN salmonea (flesh-coloured Tree Pæony).—Ranunculacææ § Helleboreæ.—A distinct and good variety of Tree Pæony. The leaves are pale green, with very little red. The flowers are double and flesh-coloured, not very different from those of the variety which has been called *P. Moutan carnea plena* ; the outer petals when fully blown are of a pale salmon colour, and the inner have a deep rich tint of the same. Native of China. Introduced by Mr. Fortune in 1846. Flowers in May. *Culture*.—Nearly hardy ; rich sandy loam ; propagated by grafting on the roots of the common herbaceous Pæony, or by division.

LONICERA ANGUSTIFOLIA, *Wallich* (narrow-leaved Honeysuckle).—Caprifoliacææ § Lonicææ.—A neat slender deciduous shrub, growing four or five feet high, the branches being furnished with narrow lanceolate leaves, fringed with short hairs along the margin. The flowers grow from the axils of some of the leaves on the young shoots, two close together, on a slender drooping stalk, which is shorter than the leaf it accompanies ; they are individually small and yellow. Native of

the North of India. Introduced about 1846. Flowers in April and May. *Culture*.—Hardy ; common garden soil ; propagated by suckers, or by layering.

CITRUS JAPONICA, *Thunberg* (Japan Citrus).—Aurantiacææ.—A dwarf evergreen shrub, of from five to eight feet high, with ovate-acuminate clear green leaves, and small flowers, the latter succeeded by fruit about the size of a large oval gooseberry, having a sweet rind and a sharp acid pulp, resembling that of the lime. It is in China called the *Kum-quat* ; and the groves of this shrub, when laden with a profusion of fruit, are said to form a very beautiful sight. The fruit is used largely by the Chinese as a preserve, for which purpose it is excellent. Native of the northern parts of China, and of Japan. Introduced originally in 1815. Flowers in March and April. *Culture*.—Nearly hardy, but forming a very neat greenhouse or conservatory shrub ; loam and peat ; propagated by grafting or inarching on the common orange.

AMYGDALUS PERSICA, sanguinea plena (double crimson Peach).—Drupacææ.—A very handsome deciduous tree, differing from the varieties of the peach cultivated for the sake of their flowers, by having these semi-double and of a dark crimson colour. It is a fine plant ; probably a Chinese garden variety. Introduced by Mr. Fortune in 1846. Flowers in April. *Culture*.—Hardy ; common garden soil ; propagated by budding on the common almond.

BOUVARDIA CAVANILLESII, *De Candolle* (Cavanilles' Bouvardia).—Cinchonacææ § Cinchonææ-Cinchonidæ.—A small shrubby plant, clothed with ovate leaves on short stalks, and throwing out from the main stems short lateral upright branches, which bear usually about nine flowers at the end ; these flowers are tubular, smooth, and divided at the end into four segments, which are sharp, and when the flowers are fully expanded, spread out flat ; they are scarlet, and have a graceful appearance when the plant is in perfection. Native of Mexico. Introduced by Mr. Hartweg in 1846. Flowers in the summer months. It is the *B. multiflora* (Schultes), and the *Æginitia multiflora* (Cavanilles). *Culture*.—Requires a greenhouse, and to be kept nearly dry in winter ; turfy peat soil ; propagated by cuttings of the stems or roots.

VIBURNUM DILATATUM, *Thunberg* (spreading Viburnum).—Caprifoliacææ § Sambucææ.—A small shrub, with bright green plaited leaves, having some hairs on both sides, and some coarse teeth on the edge. The young wood is slightly hairy. The flowers are white, and grow in small spreading cymes, not acquiring the radiant condition which gives their beauty to the Gualdres Rose and some other

kinds. Native of China and Japan. Introduced by Mr. Fortune in 1846. Flowers in May. *Culture*.—Hardy; common garden soil; propagated by cuttings of the half-ripened shoots.

PÆONIA MOUTAN globosa (globe-flowered Tree Pæony).—Ranunculaceæ § Helleboreæ.—One of the finest of all the varieties of Tree Pæony. The flowers are large, round, and perfectly double, white, the base of the petals being stained with large blotches of deep purple, as in *P. Moutan papaveracea*. It is a very desirable kind. Native of China. Introduced by Mr. Fortune in 1845. Flowers in May. *Culture*.—Nearly hardy; rich sandy loam; propagated by grafting on the roots of the common herbaceous Pæony, or by division.

STANHOPEA GUTTULATA, *Lindley* (speckled Stanhopea).—Orchidaceæ § Vandææ-Maxillariidæ.—A very handsome epiphytal species with the habit of its allies. The flowers are large and very handsome, of a pale nankeen colour, covered all over with purple speckles, but wanting the eye-like markings which are found in *S. oculata*, which it otherwise somewhat resembles. Native of South America. Introduced about 1843. Flowers in June and July. *Culture*.—Requires a moist stove; turfy peat soil; propagated by division of the plant.

CHLORÆA FIMBRIATA, *Poeppig* (fringed

Chloræa).—Orchidaceæ § Arethuseæ-Limodoriidæ.—An interesting terrestrial orchid, with smooth, oblong, light-green leaves, and spikes of flowers growing about eighteen or twenty inches high; these flowers are green and white, with a fringed appendage extending beyond the circumference of the flower-spike. Native of Chili and Valparaiso. Introduced in 1848. Not yet flowered in England. *Culture*.—Requires a greenhouse; free loamy soil; propagated very sparingly by division of the roots.

CATTLEYA LOBATA, *Lindley* (lobed Cattleya).—Orchidaceæ § Epidendrææ-Læliadæ.—A very handsome epiphytal species, nearly allied to *C. labiata*. It has furrowed club-shaped pseudo-bulbs, each of which bears one oblong blunt leaf. The flowers grow in pairs on a long peduncle, and are of a uniform purple colour, tinged with violet, and having some rich crimson veins on the elegantly-cripsed lip; the petals are oblong-lanceolate, very wavy and irregularly lobed; the sepals are lanceolate and straight. It is, perhaps, but a variety of *C. labiata*, but is at least "as well-marked a form of the genus as *C. Mossia*," and sufficiently distinct to be worth the attention of cultivators. Native of Brazil. Introduced in 1836. Flowers in May. *Culture*.—Requires a warm stove; turfy peat soil; propagated by division of the plant.

PRACTICAL HINTS AND ORIGINAL NOTES.

EVERGREENS.—Whatever may be said in favour of the best establishments of our forefathers, one thing seems a universal accompaniment to the main plantations,—ill-grown deciduous shrubs and plants; and the modern occupiers seem content with the chilling and mournful appearance in the winter months. There may be exceptions. Many will be almost inclined to contradict us, who for the moment forget that they have never paid a visit in the winter months, but have seen all the otherwise naked trees with their summer clothes on, and, moreover, viewed the places themselves when all the advantages of the season have been added to the scene which is so dreary in winter. Those who do pay a little attention to things as they pass, may recollect to have observed, in some of our most talked-of establishments, a succession of centennial lilacs, syringas, thorns, and other deciduous shrubs, along the whole length of a drive up to the mansion; and however gay these may look one month in a year, and decent while they retain their leaves, they are the most miserable objects alive when there are no leaves remaining. Again, neglect has, in most cases, caused these monstrous shrubs to grow naked at bottom, so that, even in the

height of summer, there is nothing near the ground but bare black stumps. The exceptions we could speak of are those very few places in which the glowing holly, the laurel feathered to the ground, the yew, the rhododendron, magnolia, and other beautiful evergreens, form the main feature, and the deciduous plants are not in sufficient quantity to disturb the general outline and plan, where the drive and the plantations about the house are bright and cheerful in winter. All this tells in favour of evergreens. People in the present age do not use country houses and garden establishments for summer merely, but they retire to ruralize at all seasons; and by a judicious use of evergreens, a garden can be made as good in all respects in winter as in summer, that is, as far as general appearance goes; we do not mean that the lawn is to be carpeted with flowers, but that the scene would be the same, and altogether cheerful, instead of presenting the sombre aspect of black sticks where green trees should be seen as far as the eye can reach.

THE POLYANTHUS.—There is in the eyes of some young growers a great similarity in several varieties of this beautiful spring flower. The varieties are decidedly less conspicuous

than the auricula, for yellow ground and scalloped edges are common to all, and the most we can hope to attain is bright, but different shades of the dark colours, and of the yellow eye and lacing. At the show of the South London Society, there was a sad blunder by the judges; but such things ought not to be permitted by showers. The first amateur prize was given to the chairman of a rival flower Society, for a pair of flowers both the same variety, one rather younger and fresher than the other, but both unquestionably the same sort; and we have this distinction to draw between the judges and the exhibitor—the judges see a different degree of brilliancy, or see one full grown, the other not full grown, or one naturally stunted, and the other freely developed and bloomed; the judges, some allowance made for their not being the best in the world, may in their hurry pass them for a pair, but the exhibitor could not show them ignorantly. He could not be deceived. He must know, as the plants go on, what they are. There can be no mistake as to their identity. Even if a label got wrong, his familiarity, day after day, would soon detect the error; and it is morally impossible that he could produce two of the same variety without being fully aware of the fraud intended. We regret that the judges were not sufficiently acquainted with the polyanthus to see that which was palpable to hundreds. A question has been raised about this flower, which may as well be set at rest. It has been objected by some, that a plant ought not to be potted up on purpose for show. This is absurd; for the best mode of growing the polyanthus is the open border, and the best way to show it is to carefully transfer them from the bed to the pot the same morning they are shown. There is no merit in growing things in pots if they are removable at all; but if a plant, of any description, *could* be potted up from the open ground to be exhibited at a show, it is as legitimate and as proper a mode of showing it as if it had been always in a pot. It is, therefore, perfect ignorance of propriety that induces a man to object to potting-up the polyanthus.

BUY NOTHING IN A HURRY.—If we only consider the difference between the price of a thing this spring and the price of the same thing next spring, the argument is strongly in favour of delay; but, in addition to this, what we buy at a high price is often good for nothing, having no one good quality but its novelty, and we find ourselves in possession of nothing worth having, with a New-year's bill of considerable amount. Let us try how the theory works. There are more than a hundred dahlias advertised this spring, at various prices, from 5s. to 10s. 6d.—suppose

we buy the whole lot which have first-rate characters given to them by the dealers and the newspapers—and if we take them one with the other at 7s. 6d., which is under the mark, the amount will be 37l. 10s.; now, before the summer is out, two-thirds of these will have proved worth nothing; the other third, or thirty of the hundred, may be worth growing, nay, though not likely to be so, let us suppose them excellent; every one of these thirty may be had next year at 1s. 6d. or 2s. each, or the whole thirty, at the very most, 3l. Now, let us ask, in the name of conscience, what are amateur growers thinking of when they give 10s. 6d. for a plant they may have in the spring of next year at 1s. 6d. or 2s., with this advantage, that next spring they will know which is good and which is good for nothing, so that they need not fool away a solitary sixpence more than a thing is worth, nor encumber their garden with a single worthless or second-rate plant? Dahlia growers may wonder that the dahlia trade declines; but it is for want of thought that they wonder. Amateurs have been taken in so often, and got so sick of it, that the trade in new dahlias would have altogether failed had it not been for the descriptive lists published in the Almanack, which reduced the choice to a dozen or two instead of hundreds, and which, besides this, gave a very good idea of the real value of those which were thought at all worth mentioning. But the horticultural world is wise enough to see that even this effort to keep up the trade in new dahlias is counteracted by the trade itself. True to nobody, they lend every encouragement to those who oppose even the authentic descriptive lists. Everything that will speak well of these worthless novelties is supported, because that which is looked upon as authentic is too limited in its praises; and the great rock upon which the trade splits is, that it encourages everything that speaks well of their wares, without once considering that the public care nothing about such praises. This year the Almanack mentions a number of dahlias, verbenas, fuchsias, and other matters, in terms that nobody can misunderstand. The amateur who buys one half of the dahlias mentioned will not have profited much by reading the descriptions. We have looked, over and over again, and cannot find a dozen that the writer praises enough to induce us to buy, if we were dahlia mad; but we pray those amateurs who wish to make the most of their money, to consider well before they lay out five pounds in support of a humbug which has lasted too long. Fifty guineas would not buy all the dahlias that the dealers say are excellent show flowers; next season fifty shillings will buy every one that will be retained

in the collections of men of taste and judgment. But verbenas are the same as dahlias; and all novel plants rapidly propagated are alike; they are not one-eighth of the price at the end of a season that they are when they are let out, and we have the advantage during the year of seeing which are and which are not worth the place in a gentleman's collection. If you must buy novelties, the Almanack leads you right in nine out of ten cases; but, except those highly spoken of, buy none till the following season.

HARDY ANNUALS.—Nothing can be more contrary to common sense and practical matter-of-fact than the ridiculous distinctions made from time to time by scientific men and professed teachers of botany. We will, for the present, take only one of their fanciful distinctions, Hardy Annuals. What does any common person, what does any man of common sense, expect in a hardy annual? Why, an annual that is hardy; that is to say, that will stand our ordinary frosts without injury. But is it so? By no means; the professors' list of hardy annuals consists of, among others, annuals that the very slightest frost kills outright. If, however, the professors alone had given us these lists, men of practical information, men of the world, who can appreciate the real value of a professorship, would not have been deceived; but the seed shops are governed by the lists put forth by botanists, and we have catalogues from all kinds of dealers, reiterating the folly which theorists put forth, and perpetuating the blunders which your drawing-room botanists originate. We could mention fifty instances of this prevailing error; and it requires immediate correction, otherwise young beginners, who cannot know better, begin their gardening with erroneous notions, that time and a few losses alone can correct. One instance is as good as a thousand. *Hardy annuals* which are in full bloom one day, and cut down by a slight frost the next, seem to us a sort of anomaly; nevertheless, such there are, and plenty of them. Lindley and Paxton both comprise in their lists of hardy annuals, *Tropæolum majus* and *Tropæolum minus*, the commonest of our nasturtiums. Now, the veriest tyro that ever took a spade in hand knows that these will not bear the slightest degree of frost, but, on the contrary, that they are as tender as the scarlet geranium, and that, if both are in the same situation, the frost that will cut the geranium, will blacken and kill the nasturtium. These gentlemen blunder much in the same way with this subject as they do on the acclimatation of plants; they make a situation warmer, and fancy they have made a plant more hardy. In this case they mistake a short life for a hardy life; so that all

annuals that may be sown in spring, and perfect their bloom, and seed before winter, are, forsooth, called hardy! In this, as in fifty other things, theory and error go hand in hand, only to be contradicted and exposed by practice and facts.

THE LADY'S FLOWER GARDEN.—There is this wide distinction between the exhibitor's flower-garden and the lady's flower-garden,—the former is as unnatural as artificial shades, temporary tables, cords, bandages, props, inverted flower-pots, muslin bags, and every other inconceivable litter, can make it, while the latter is gay and crowded, redolent of sweets, and profuse of bloom, and nothing artificial about it. I am not quite sure that, in a certain noble lady's flower-garden hardly eight miles from London, I saw a vacancy large enough to hold a single plant. The month was June, and flowers of course plentiful. The garden was a complete mass of everything that was at all convertible to a nosegay. The *Delphinium grandiflorum*, sweet peas, *Coreopsis tinctoria*, the columbine, and various kinds of lily, formed a complete mass of flowers along the back of a border the whole length of the ground, and of which the front two feet were devoted to more dwarf subjects; German stocks, in endless variety of colour, at equal distances, in patches of about four or five; all the rare annuals, also, one scarcely preponderating in quantity over the other; and, in fact, those which were so profusely blooming were almost smothering carnations and picotees that were struggling through the mass, and China asters making their way below. In short, there appeared to be a succession of everything ready to occupy the space the instant the present gorgeous tenants were ejected. Ten thousand bouquets might have been cut from the border without apparently destroying a feature. But this was only one border. Another was occupied with perennials only. It was not so gay, but it had a peculiar interest attached to it. There was a portion of the garden upon which no labour was spent more than once in three or four years, except so far as digging up the soil after all the plants were parted through in spring: no watering, no planting or transplanting, and very little weeding. But there was a Dutch garden, or a geometrical garden, like the pattern of a kaleidoscope, and as even as a Turkey carpet. Here we had the scarlet of the *Verbena Melindres*, the blue of the *Nemophilla*, the orange of the *Erysimum*, the white and yellow of the pansy, the dark purple of the little *Lupinus nanus*, and other choice things, not obtruding themselves more than six inches from the ground, to disturb the exquisite arrangement of this carpet of flowers, the very picture of order and unifor-

mity of pattern. But there was, besides all this, a row of little beds, in which every annual worth growing, and some that were not, had a place. Here everything that was new had a chance of patronage; and perhaps, while the seed was scarce, a very worthless thing had a second year's turn, but in a general way, only those that were worth a space were continued in the garden. There were not wanting groups of roses, honeysuckles, and jasmynes, in flower, and many clumps of rhododendrons, azaleas, andromedas, and other flowering shrubs, that had done their work some time for the present season, and were growing as fast as they could for the next. There was no want of taste, for that which looked most like it was the mixed nature of some of the borders and clumps, in which the only object appears to have been to get in as many things as possible, ranging a proper height, to be dwarf in front and tall behind; and the mixture was complete, without the slightest order, or regularity, or form, except as to the height. This very confusion was beautiful. It was a bank of wild flowers as to the planting, but all the objects were good. It was a wilderness of beauties. But the walks were smooth as sand, the edgings almost as even as artificial. The grass, or lawn, wherever there was any, was like green velvet; and as for a weed, the place was as if such things did not exist. There, too, was the arbour covered with jasmine and honeysuckle, with mignonne, and pinks, and stocks round the foot of it, to give fragrance to the air, the fountain and gold-fish in the clear basin before it, and the birds, harboured as carefully as bees, singing in the surrounding trees and bushes. But one paddock parted this little paradise from a florist's garden, with more contrivances to shade, shelter, and support, than there were plants to use them on. The contrast was striking. A forest of poles, with garden-pots at top, proclaimed a plantation of dahlias; a posse of tin helmets prepared for the carnations and picotees; poles, small tables, canvass roofs, and a dozen sorts of watering-pots, endangered one's shins at every turn of the paths. I exclaimed, "Oh, that such preparations should be required to produce a horticultural show! They take away all the charms of a flower-garden."

THE HELIOTROPE.—This very general favourite is one of the least effective, and, as grown by most people, untidy of all clump plants. It is too tall for any bed or border that has a well defined edging, for it grows from eighteen inches to two feet, and in tolerably good ground rambles about for want of support in itself. Its perfume will always retain for it a place in the flower garden, but we have seen many a clump of it that spoiled

altogether the design of which the bed it occupied formed a part, because it was too tall for the place, and too weak to hold itself up. Still, it is a plant that we have made subservient to our wants, even in the small beds of a Dutch garden; we have limited its height to a few inches, and in the same way that we have seen other plants managed for the same purpose. Even a tall dahlia or a tall verbena may be converted to the uses of a dwarf one. In the first place, we strike the tops of forward plants in May, and these naturally bloom earlier and shorter than those from side-shoots; we pot them in small forty-eight sized pots, in loam and sand, two-thirds of the former, and one-third of the latter; but if the loam happens to be poor and sandy, there is no occasion for a mixture at all. Place them on the open ground, where they will have the sun and air. Attention must be paid to watering, because they will require more frequent moisture than if they were in good compost. This naturally stunts the plants a good deal, and they show bloom early; plant them out without disturbing their balls of earth, in the beds which they are destined to fill, about six inches apart, or from that to nine, according to the space, for they will fill up nine inches of vacancy in the course of the season; we prefer, however, six inches for effect, because you may have all their first blooms before they begin to straggle at all. This over, and the heads must be cut off, and the plants be all pegged down to the earth; the side shoots will come up and fill the bed, and they will require all the branches that get up above six inches high to be pegged down, unless there is a head of flower; by using slight pegs a pretty good length, the shoots can be fastened down to the ground, or merely sloped so as to lower them, and where there is a superabundance of growth, cut away parts of the plant; the bed must not get too crowded, and a little practice will enable the operator to keep a constant succession, or several distinct seasons of bloom, without the plant being allowed once to ramble out of bounds. If a plant of the Heliotrope, grown in the common way, and in moderately good soil, be observed, it will be seen that it attains the height of a foot and a half, and if standing close together, even two feet, before the top or crown bloom is fully developed, and all up the sides will be found young shoots coming out at every joint. Now, if a plant of this character be laid in the ground without the ball of earth being disturbed, but placed almost on its side, and covered up, and the whole length of the plant pegged down to the soil, every side shoot will push up three or four inches, and bloom; so that whatever state the plants may be in while

potted, there is no difficulty in making them all dwarf, for the purposes of a clump or a compartment in a Dutch garden. One of the best modes of growing the *Heliotrope*, which naturally grows eighteen inches or two feet high, and continues blooming for months, is to grow them in a circular bed cut out of the lawn, or situate in the middle of gravel work, and surrounded by a wire, or wicker, or rustic basket-work, full eighteen inches high, making also a handle across the basket; the *Heliotrope* then fills the basket, and appears really a basket of flowers. The most effective way of planting them is to keep them in forty-eight sized pots till they have grown in rich soil a foot or more high; then, before putting out the plants, make the circular bed rising from the edge, which is nearly level with the path, to the centre, which should be a foot higher; the plants should then be turned out with their balls of earth whole, and placed within six inches of the edge, and six inches apart; another circle about eight or nine inches nearer the centre, but only six inches apart in the circle, and so on with a third and fourth, or more if necessary, till you come to the centre; take away the sticks or other supports which the plants had in the pots, for they will now branch out, and being pretty close will support each other. The rising of the ground gives the plants the best possible effect, and when in full bloom the whole forms a pretty and very desirable object within sight of the drawing-room or parlour windows; much depends on how nearly you imitate a basket, for it should appear like a moveable object.

BASKETS FOR FLOWERS ON LAWNS, &c.—

There are few prettier things than these baskets, judiciously placed and tastefully furnished. When there is abundance of potted plants, these baskets may be filled with various flowers, and with some care in the grouping have every appearance of real baskets of miscellaneous flowers, changing with the seasons. The principal point requiring attention is to conceal the pots; the outside row next the open-work may be well hidden by a package of moss, and the plants in general must be chosen to conceal their own pots towards the centre; where there is any appearance of pots you must call in the aid of moss, but in the grouping of the flowers there is much room for the exercise of taste and ingenuity; but there is no real difficulty, for from the month of June there is such abundance and variety, that there can be no want of contrast in colour or form. The outside circle may be *Nemophilla insignis* and *Verbena Melindres*, (the one a brilliant blue, the other a splendid scarlet, both inclined to ramble over the edges of the pots, and therefore well calculated for the outside circle,) alternately placed singly,

or in twos, threes, or fours, there being more of a mass of each colour where there are three or four pots; both of these, too, are dwarf, and will give a pretty finish to the outside, by rambling on the edge of the basket. *Calceolarias* and pale fuchsias will make an excellent second row, and tower above the outside ones, but not too much; then we have roses, *Lupinus polyphyllus*, lilies white and orange, and towards the centre, where they are wanted tall, the *Delphinium grandiflorum*, or any other tall-growing subjects. Another may be filled in a different way, but the colours may be contrasted just as beautifully. The convolvulus minor, the damask China rose, and double-flowering nasturtium, would form admirable outside subjects; columbines of various colours, sweet-williams, cinerarias, the provence white, moss, and crimson roses, dwarf hollyhocks, and many other beautiful subjects may assist the grouping, but the principal thing to attend to in the display of these flowers is not to mix them too much. Let some two or three, or four pots of a thing form a mass of the flower, and three or four others form another mass in contrast, for all such objects ought to be bold, so that the effect of their colours should be seen at a distance, and not be lost, as all minutely mixed patches of flowers are; let everything be seen distinctly. Divide half-a-dozen blue flowers all over a nosegay, and they would be lost at the least distance; put the half-dozen close together in one part, and they may be seen as far as the nosegay itself; so also with scarlet, or white, or yellow. Keep the colours in masses, and no matter how far off you are, they show up their colours well; mix them all very much, so that no two of the same colour come together, and however pretty they may look very close, move back a few yards away comparatively, and they form a one-coloured mass, with nothing distinct, and no perceivable effect. Suppose we had to form a group of flowers in a basket, to be seen fifty yards off; let three pots of convolvulus be near on the outside, and three more in the next row inwards; here will be six pots forming a mass of bright blue that may be seen all the distance. Take two or three pots of the scarlet verbena, place them in the same way next the edge, and three or four more farther inwards; they form a mass of scarlet quite as conspicuous as the blue. Within these, and nearer the centre, put three good pots of the white lily, forming a beautiful contrast or back-ground to the blue and scarlet, and next to the white a patch of two or three pots of the orange or Fox's lily, equally effective at any distance, because of the masses which they present to the eye, much farther off than we can distinguish the forms of the flowers. Other baskets may be filled with

more regard for fragrance than appearance. The mignonette, the ten-week stock, heliotrope, and pink for the dwarf, and the cabbage rose and dwarf honeysuckle for taller ones, combine to make the most rich and effective of all the aromatic flowers and plants; some fancy the musk-plant improves it, we do not. In July most of the annuals can be had in quite as great perfection, by only sowing accordingly, and the carnation and picotee come to make up for one or two subjects that go out. This basket-gardening should be done close to the house, and is the only pardonable excuse for disturbing the green carpet of lawn before the windows of the mansion; clumps cut in the lawn, and seen to be such, are inexcusable, and ought never to be permitted, unless by some contrivance they can be made to appear temporary; nothing ought to be seen on a lawn but the clumps that are close to the verge.

FRAME CUCUMBERS—OPEN-AIR CUCUMBERS.—There is nothing to prevent the holder of a very small garden from sowing seeds in May, and growing cucumbers in the open ground as well as he can grow a cabbage. The difference between the open-air cucumber and the frame cucumber is, that the former is very much stronger than the latter. There are those, and many of them, who say they prefer the out-of-door fruit to the frame fruit. There is no affectation in this, though it is not our choice; those grown out of doors are very strong, and if a person like the flavour of cucumber very much, the strength may induce him to give the preference. The difference lies in the rapidity of growth—a frame cucumber may not be four days old when cut of an extraordinary length; the out-of-door cucumbers will be seven or eight, or ten days, growing half as long. Now, pickling cucumbers are necessarily grown out-of-doors, for if the small ones be gathered from the frames they are insipid for pickling, whereas those out-of-doors are high in flavour, and would be still higher if the heat were equal to that in the frame, but the cucumbers out-of-doors are naturally thick-skinned and stunted, through the many checks that the fruit has by cold winds, heavy dews, and great changes of climate to which our open air is subject. It has been a very common thing to say that the fine cucumbers are not so well-flavoured as moderately grown ones: this is quite true—fourteen to four-and-twenty inches, grown in a very few hours, secures a mildness almost amounting to tastelessness; but the same variety of cucumber, grown more slowly, would have more flavour, and in the open ground it would be as strong as anybody could wish. The best way to grow the cucumber out-of-doors is to sow the seed in the open

ground where they are to grow; put about three seeds two inches apart in the centre of every four or five feet square, for they will require that room to run in; when they have four rough leaves, pinch out the growing heart; this will make them throw out lateral shoots, which are to run the length and breadth of the space marked out; they will bear, and give no trouble. If there are too many fruit for the vine to grow nicely, they will all grow smaller; if they are wanted fine, do not let more than three or four fruit swell on each vine, but generally speaking a private grower may let them have their own way, for there is sure to be enough grow large for all ordinary use.

DOUBLE STOCKS.—In some not very ancient publication, perhaps one of the journals or periodicals for the present year, one of your red-hot theorists recommends single stocks to be placed near double ones, that they may be inoculated by the very few anthers that appear occasionally among the said double stocks; and, like a good many more who have observed particular facts and not considered the circumstances, he jumps at conclusions without any reason to guide him. He has always saved seed from single stocks grown among a great many double ones, and always found a large average of them come double; *ergo*, he says, or rather writes, If you want good double stocks, plant a single one among a great many double ones, and you will obtain double. There seems, to ordinary people, good reasoning in all this; but nothing can be more fallacious. Another says, unless double stocks grow near single ones, you cannot have double stocks from the seed: nothing can be more erroneous than this. The growing of double stocks near single ones does not in the least degree affect them; but there are facts which, being connected with other facts, explain the whole mystery. My neighbour grows a good many things very carelessly, and nothing very good; he reads something in Paxton's *Botanical Dictionary* about selecting seed from single stocks that have grown near double ones. Now, I have been very choice of my stocks for years, and have some years been unable to save seed, for want of single ones to take seed from, and especially of a double white sort, which is called by many different names, but which has more than once bloomed all double. However, I have always a good stock of seed, for it will grow some years old, and I save all I can, so that if I miss a season I go back to other savings. My neighbour never could get me to give him my seed, but I never objected to giving him or anybody else stocks as soon as I could see that they were double. This just answered his views, and accordingly, one year

he placed one of his single stocks amidst a little forest of my double ones. He had carefully potted some on purpose, and he had taken some care of the colours; and there could be no doubt that he had, as well as he could, completely hemmed in his single stocks with double ones of the colour, or near it, in several different parts of his garden. He had also taken the precaution of removing all the other single ones from his garden. Some of his neighbours, equally jealous of my stocks, besought him while they were growing, to spare them a pinch of his seed; and many were the promises he made, and, to do him justice, performed; but not a double stock came out of the whole number of growths. This put the theory of double stock growing by placing single ones among double ones quite on one side. I had all along laughed at his notion, and the next year I offered to let him plant a single stock in every one of my beds of double ones, or rather mine as they came, for I had single as well as double in a general way, although the double so greatly preponderated. This he availed himself of, with no better success than before; and he had to deplore that Mr. Paxton, and half-a-dozen other scribblers, had deceived him. But I told him, as I had told others long since, that as the double stock had no organ of generation, or at least very rarely could any be found, the proximity of a single one to a whole thicket of double ones would have no effect; and, to convince him, we planted our single stocks out in the kitchen-garden, and the seed from it was just as good, and brought flowers just as double, as if it had been grown among them. The truth is, that the doubling of stocks is a habit, and the few single ones that come among what are called good sorts, partake strongly of the habit; and it is from these alone that seed can be got to produce double flowers. If the seed be mixed, such as the seed bought at the shops, you may save seed from the very few single you happen to get, and yet be as wide of the mark as possible. I have seen the seed saved from German stocks, when there was not more than one single to ten double, and their produce the next year nearly all single. The fact is that the single ones were not from the same seed as the double ones, and therefore, although they came among the double stocks from Germany, their seed had not been saved from the same race at all; so that nobody is safe from this adulteration, until by a lucky chance they get a bit with their own seed, or somebody's else that is given to them. I saved seed of all the leading German colours, and saved the whole separately. The first season I had it there was but one sort that came good and double, and this I kept saving for years. It was three

years before I got another colour in good order, though I sowed imported seed every year. I therefore conclude, *First*, that the proximity of double ones would not have the least effect upon the seed of single ones placed there.

Second, that the disposition to go double is a confirmed habit, and the seed of the single ones that escape going double has all the character and habit inherent.

Third, that to keep up the stock well it is never safe to sow all the seed, but that you must expect, now and then, to miss the seed altogether.

Fourth, that the disposition to go double may be sometimes seen in a single stock with one or two extra petals, or the petals broader than usual, or inclined to crumple, but that these indications are not at all necessary when you are saving seed from your own stock which is already in a good train.

There is a popular notion that there is something to be done in the culture of the stock which will cause it to be double. There may be much done to enlarge the flowers, and the larger the flowers are the more double they appear; but we have tried scores of experiments, with what we may call confirmed single seed, and could never bring a double one, for there is something very obstinate about the disposition of their flowers. When you get into a good strain you may keep up a double habit for years, and even lose the sort for want of single ones to perpetuate them; but if you sow from single ones which have not the propensity to go double, you may work just as many years before you get a double one, for they just as obstinately come single. Now the German stocks are for the most part carefully saved, but there or here they will put inferior seeds to adulterate them; and therefore, when you fancy you are saving the same breed of seed that the Germans came from, you may be only saving seed from a common single kind that never had a disposition to go double—one from the seed put in to increase the quantity; and it is this that makes the chances of double flowers from among the seed saved by the regular seedsmen exceedingly small. They save indiscriminately according to the colour; but, when you cannot depend on the seed, buy all from one stock, look out for those seedlings only that have very broad petals, or five petals instead of four, because this is a sure indication of a disposition to go double. The only reason I can discover for people fancying that the double stock influences the seed is this: where you see good stocks, and very few single, and all the seed is from one batch, the seed of the single is sure to be good; but if the single ones among the double had been planted by themselves a mile off, the seed would be just as good.

GRAFTING GERANIUMS.—There is more whimsicality in this than utility, unless it be to form standards in a hurry. Mr. Ansell once exhibited some of the coarse kind of scarlet which had been so treated, and they were at least novelties in their way. The plan of grafting is only useful where a stock of greater vigour than the sort required to be grown can be made to contribute to the otherwise weakly growth a portion of the strength which does not naturally belong to it. There are some geraniums inclined to run up to a considerable height, and exhibit a very strong trunk or stem. There are other sorts of geraniums, of weakly and even pendulous growth, which would be greatly advantaged by a strong tall stalk, so that the plant, when once fairly grown, would exhibit a sort of pendulous head upon an upright trunk. The operation of grafting is very simple. Let the stock and the scion be the same size, if you can, because then a sloping cut upon both, and a join like the splicing of a broken stick, will be enough; but if it be smaller, the stock may be cut up like a wedge, and the scion may be split up a little way, and the inside cut outwards, so that the two parts are shaved off from the inside to a thin edge. This being placed over the wedge, and brought close up to one side, so that the back of both completely meet on this side, although it may fall short half-way on the other, is tied in its place firmly, but not too tightly, and covered with a little grafting wax, and the union will be complete. This grafting wax is made of half bees-wax and half resin, which being melted in a pipkin, will be found to require, to fuse it, a larger degree of heat than the plant would bear, consequently, it must be softened with tallow-grease until it will melt at a moderate warmth over the fire, but harden with the ordinary atmosphere. When the graft is on the geranium, the stock must not be allowed to push, but all shoots that make their appearance must be rubbed off immediately; nothing but the graft being permitted to grow. This must be stopped directly, to induce side shoots, and if there be not enough to form a good head, stop the side shoots also, that they may in turn throw lateral branches, and so become very soon the means of forming a handsome head. The form of the head must depend on the habit of the plant. It is quite certain there must be no support, therefore in choosing the habit of the graft you must keep your mind on the necessity of selecting a sort that will support itself without any assistance, or so pendulous as to be appropriate in the form of a weeping standard. It must not be any of those kinds that will not hold themselves in a position independently, or fall gracefully down. But there is another advantage in

grafting; because we can insert half-a-dozen sorts, which, being contrasted in colour and alike in habit, may prove a very desirable object. The purples, scarlets, rose colours, whites, clouded, spotted, fringed, speckled, and otherwise contrasted, would form a mixture that could hardly fail to be striking. In this case the habits of all the grafts must be alike, for if one were more robust than the rest, it would grow at their expense; whereas, if they are all about the same habit, the knife may keep them all well proportioned. Where several grafts are to be put on, there should, by rights, be as many branches to the stock; two or three, however, can be put on one stem, by first cutting two square sides, or three square sides, to the stock, and then cutting a square side to each of the grafts, to fit the three sides, on the side opposite a good eye, and cutting out the eyes on the inner side of the graft or scion. They are then all bound together, and unite as easily as one. The three grafts then shoot out their branches from eyes purposely left outside, and when they have grown to three eyes the branches may be stopped by pinching out the growing points, and leaving them to grow laterally to form a head. As these three grafts all but touch each other, it is obvious that if the inner eyes were not cut away, they would grow inwardly, and push one another out or off the stock. A tie to support the three grafts in their places may be loosely but firmly tied round near the top, to prevent them from being borne down outwards by the weight of their own branches.

EUPHORBIA JACQUINLEFLORA.—There is not a more beautiful stove plant than this brilliant little subject. It has suffered, perhaps, as much from what is called most erroneously skilful gardening, as any other we know of. The rapid growth of this plant is destructive of all its beauty, for that consists in the closeness of its sparkling scarlet flowers, and rapid growth spoils this. It is usually shown an uncouth, half-broken, half-cultivated plant, with many stumpy ends, which have been at different times robbed of their natural points, and this has induced shoots from below, and an irregular growth. The whole culture of the plant is wrong. It wants very little more than peat earth; it does not require much water. It is better in the coolest part of the stove than it is when excited much by heat; you are not getting a plant six feet high in a season by these means, but you are growing a plant that is handsome in all its stages, and by no means so uncouth as the specimens found in ordinary stoves, and even in good collections. It strikes readily with bottom heat, but as the milk oozes out wherever it is cut, the pieces that are intended

for striking should be cut close up under a joint, and be laid a little while on a shelf in the house to dry up the milk, before it is potted for striking. The cuttings should then be put into a pot large enough to take a glass outside the cuttings, so as to press the edge down into the soil, and exclude the external air, and all draughts and winds. This pot may be placed in the tan of the stove. The bell-glass which is placed over the cuttings should be wiped every morning, and the cuttings will soon begin to grow, which is a tolerable indication that they have begun to emit roots. A few days longer, however, will not hurt them, when they may be potted off, a single plant in a pot of the size sixty, with one-third loam, two-thirds turfy peat, broken very small, well mixed; see that you have a thorough drainage. As soon as these plants have established themselves, that is, recovered the check which is always felt in the repotting, let the top be taken off or out as neatly as possible. The plant must be placed now in the coolest part of the hot-house, and be watered only when very dry. It must not be allowed to flag, but it must have no more water than is absolutely necessary. If any of the branches grow too strong for the remainder, remove them altogether, or shorten them, but be not discontented at the slow growth of the plant; or if you feel inclined to try the difference between slow and rapid growth, let half the plants be sunk to the rim in the tan from the moment they are potted, and instead of peat two-thirds, and loam one-third, let there be peat a third, loam a third, and well decomposed cow or horse-dung a third. These plants will be eighteen inches high before the others are eight; but there will be no comparison with regard to beauty; the slow growing ones will be more bushy, more symmetrical; the joints closer; and when the bloom comes, there will be an abundance, while the tall growing plants, that have been excited, will have only a few flowers towards the extreme ends of the branches. When even these apparently stunted subjects have filled their pots, they may be shifted to those a size larger; keep to the same compost, the same treatment; but, by the time these are in their second pot, the excited ones will be in their third or fourth, if they have been changed as often as their roots filled the old ones. The short plants must be watched, to see that they do not incline to ramble at all, for if any shoot takes the lead, it soon stops the rest of the plant. The shifting from one pot to the other, the watching so as to know when the plant requires water, the care requisite to prevent its having too much, and the occasional examination of the drainage, to see that water can leave the pots freely, constitute all the rest of

the management of the *Euphorbia jacquiniæflora*. But those who cultivate upon the checking principle instead of the exciting, have far the greatest trouble, and exercise far greater skill than those who grow in the generally exciting way that distinguishes all the plants we have ever seen exhibited, and destroys their natural form and habit. There is no skill required in merely keeping a plant in heat and rich compost, and shifting it often into larger pots, sinking them in the tan for the greater part of their time; and we hope to see the time when plantsmen will look a little more to nature, and Horticultural Societies a little more to what a plant ought to be.

STRAWBERRIES.—Many people imagine that when strawberries are once planted in the ground, the growers have nothing to do but pick the fruit in their proper season; but strawberries, like everything else that grows in a garden, are better or worse for the treatment they receive, and the labour is never thrown away. Undoubtedly, strawberry-plants will stand a long time, and if the ground agrees with them, they want but little care or culture. The ground should be good strong loam, and not much dunged. The runners for plants should, by rights, be pegged to the ground at the joint wished to be struck, and all the runners beyond that ought to be taken off, that the strength may be driven, as it were, into the new plant. These rooted runners at the end of the season may be planted at once into beds and borders, such as we have mentioned, a foot apart all over, or a foot apart in rows, and rows eighteen inches apart over a large space; we prefer beds four feet wide, with four plants in width, and a path or alley of two feet or eighteen inches between the beds. If these runners are well rooted, and got out into the beds by the month of August, they will bear handsome fruit the first season. The market-gardener and fruiterer for sale, endeavour to get the berries as large as it is possible, but the private grower had better look to flavour; and the same variety of berry in two different grounds will be so much unlike, as hardly to be known at all by flavour. We remember once growing a very insipid strawberry, "Wilmot's superb," on a strong loamy soil without dung, and we were going to say without care or trouble, certainly with very little of it. The berries did not come more than half the size we had seen them; they were so handsome in their growth and colour, that we sent some of them for exhibition at a provincial show, where they obtained a prize for flavour, and few knew the variety. But this is a very common occurrence; grow a thing small that is naturally large, and you have strength of

flavour; so that private growers should never be over anxious for large fruit. It extends to everything in cultivation; whatever is required mild should be grown large, whatever is wanted strong should be stunted, that that is to say, should not be attempted large. The two-ounce gooseberries are very poor in flavour, but grow the same berry in the common way, and you will no longer complain. However, to our present purpose. The strawberry-beds, when once planted, require to be kept clear of weeds; when the flowering-time has arrived, there should be a layer of straw between the rows, so that, if it should rain hard, the dirt may not wash up or splash up on the fruit, and when once well soaked, the straw prevents the moisture from evaporating so much as it would without the surface being covered. Market-gardeners, besides keeping the ground rich, will constantly water the beds when the fruit is swelling, that they may attain the full size. Private people who value flavour more than size, will leave this part alone, or, if they do water, it will be only in extreme cases, and not as a system. The gathering over, the runners are either cut all close off, or pegged down between the rows, or cut off to plant in other beds, as the case may be; but if strong runners are wanted, it is better to peg down the strongest plant on each runner, and to cut off the runner beyond the plant, because one runner would have two or three plants. However, the great object is to rid the plant of the runners, so that all the strongest of the plants may be picked off and planted six inches apart in nursery beds, to grow into strength by the time they are wanted. The beds being cleared of the weeds and runners, require very little more care till the autumn; then they may be forked over and left till the spring, when they may be again cleared, all their dead leaves and straggling runners be taken away, and the bed left to go through its spring blooming and bearing again; but, although these beds will stand for a considerable time, new beds ought to be occasionally made, to follow up as a sort of succession; and directly any old ones get shy of bearing, or look unhealthy, give them some other crops, and your new succession beds will come in. But always keep in mind that strawberries, to be of the finest flavour, must not be grown too large; the size can only be attained at the expense of the quality. It has always been proved so by those who take pleasure in observing such things, and always will; it is a natural consequence in vegetation.

APPLE TREES IN POTS.—Few people take the trouble of doing things that are not profitable, but those who can gratify themselves with whims of this sort are not to be condemned

altogether. When a few bushel of apples can be grown on a single tree, and only time is required to bring a young tree to this in the open ground, there does not seem to be any great object in sticking a tree in a pot to get half-a-dozen half-sized apples; but we hardly know anything prettier than fruit-trees in pots. The apple especially is a pretty flowering shrub, beautiful in bloom, and handsome in all stages of its fruit. The various sorts may be made subservient to the formation of a pretty collection, and they take very little room. The plants for this purpose should be grafted on paradise stocks: any nursery will supply these; the sorts should be such as are most showy, such as Fearn's pippin, Golden pippin, Blenheim orange, Hawthornden, and such as have a distinct character, and are grafted close to the ground. These must be root-pruned, that is to say, the roots cut in with a very sharp knife, so that they may be made to go into the pot, which should not be larger than size thirty-two or twenty-four at first. The head also must be cut in to a reasonable size, and the plant in fact formed for growing into a small round head. It may be two or three years before the plant bears in a pot; but keep in mind that if it grows too vigorously to bear, it will soon be starved into bearing condition, and if it grows its wood too stunted and unhealthy, it will require a change to a larger sized pot. Two or three seasons will bring any one into bearing, but they must be liberally watered in dry parching weather, because it must be recollected that the roots cannot travel after water, and they are a good deal confined. We remember to have seen a collection of these potted apple-trees at the Swan, at Stockwell, standing about the garden, on the walks, and in the paths, all with more or less fruit on them, and the effect was very good. They may be shifted yearly while at rest, and after the leaves have fallen, until they are in number eight pots, after which they should be managed to go no further, as they would lose much of their interest, and are very troublesome when the pots are too large; the only way to keep them within bounds when they have attained this size is to occasionally prune their roots.

UNDRAINED GARDENS.—The difference between a well-drained garden and one in which the water stagnates for want of draining, can only be known by comparison. I had a very well-furnished herbaceous border; I took the pains to run a main drain three-feet-six deep along the entire front, intending it also to form a receptacle for side drains from the rest of the ground; but many circumstances prevented me from perfecting my job for two years, and the effects were so

palpable, that I noted many of the points to which my attention was called. I called the border herbaceous—I ought rather to have called it a perennial border, for the chief subjects were perennial bulbs and other plants. An opposite border was formed to match this, and they were simultaneously furnished with the leading bulbs, lupines, delphiniums, and other showy things. In the spring I also gave them dahlias, fuchsias, hydrangeas, and some other subjects not exactly hardy. In the winter I covered both borders with tan during the extreme cold weather, and in March I cleared them of their covering. The month of May showed a wide difference. In the drained one the fuchsias, hydrangeas, and dahlias all shot up strong; in the undrained one every root and tuber was rotted. Among the other very hardy things, the one produced them all stronger than they were the first season, the other weaker; and all through the summer the difference was maintained in a degree scarcely to be described. Of course I was not long being convinced of the advantages of draining; not that I wanted this to prove to me one was better than the other, but I confess that though prepared for a difference, I was by no means prepared for such an extraordinary difference as there proved to be. The taking in of another piece of ground to turn into lawn and shrubbery, occupied me so much that the garden remained the same,—I did not complete the draining the next year; among other neglects, I did not even cover the borders at all, but though there was some hard frost during the winter, there was nothing lost on the drained border; the dahlias, albeit so thick and widely spread as to form a complete patch, came up; the hydrangeas and fuchsias, though cut down to the ground, shot up again from their roots; everything looked stronger than ever in the drained border, while some of the hardiest things went off in the undrained one; and though May was not the month to choose for draining, I ran another drain down in front of the neglected border, and two others down the middle portion of the garden. The crops have been so far better ever since, as to render it almost incredible that the produce was the growth of the same piece of ground. A deep ditch across the end received the four drains, and although they were two rods distant from each other, they proved an effectual drain to a garden which in winter time was occasionally so wet that when a spot of earth was dug out and left for half-an-hour, it was half filled. Let nobody therefore neglect draining a garden; if it be the very side of a hill, where one would think no wet could lie, it may, nevertheless, be saturated with springs, so that the wet of the rains cannot sink into

the ground, and all is swampy. Let the drains be direct down hill; let not any nonsensical theory persuade or influence you to make diagonal, or herring-bone, or sloping drains; let all be from the highest ground to the lowest, that the run of water may have no impediment. Let the drains be three feet deep at the least, and provide a good outlet; if the ground be so stiff and so wet that the distance of two rods from each drain to the other be insufficient, run other drains between to make them only one rod distant, but try two first; we never failed but once at this distance, and that was in a piece of clay land, in which the springs oozed out all over it; and that will not occur once in a hundred times.

PLANTING OF POOR LANDS.—There are but few soils, however poor, but may be turned to good account, for where hardly any other subject will grow, the fir will flourish. The first step necessary is to *dig*, and if the ground be any better below than above, to *trench* over the whole space; next to this, but not so good, the ground may be dug in rows a yard apart, the width of the spade only. This done, plant the trees, which should be one-year-old seedlings, that may be purchased at one shilling per thousand, and removed any time after the middle of October in fair weather; these are to be planted in rows a yard apart, and eighteen inches distant from each other in the rows; the ground therefore that is dug in rows only requires the plants to be inserted in the centre of the dug part with a common dibble. Wet weather should be chosen for the work, for unless the plants are well settled in their places, and the ground well drenched with wet, the trees have not a fair chance. The best way therefore to provide for any extensive planting is to do the digging or trenching at the latter end of the summer. Most of the seedlings for planting are procured at seedling nurseries, but if there be any previous intention to plant before you are ready to carry it out, you may sow your own seed; still unless you are going to plant on a large scale it is not worth the trouble. If you have any doubt as to which kind of fir will answer best, try two or three; larch is the most rapid grown in most soils, but the Scotch fir and larch alternately will be a good mixture. The choosing of wet weather for planting is of the highest importance, and as you may have the seedlings some time before this occurs, we must provide for their keeping: dig a small hole or trench six inches deep, fill this half full of mud made of half common soil and half rotten dung, mixed up with water to the consistence of thick cream; untie your bundles of seedlings, place them upright a few at a time in this hole, securing them close at one end or one side,

and no matter how much or how little of the space is occupied; keep them in this place, placing a brick edgewise close to the last; the mud they are in will preserve them for months without damage, at any rate until wet weather sets in, or enough wet to saturate the ground. They may then be taken out of their preserve, (that is out of their once muddy bed, which will now have dried up,) and be planted as directed. In the spring the weeds of all sorts must be cleared from the advancing trees, until they are too large to be hurt by them. The trees require all the space immediately round them, but so long as a foot diameter be cleared to each tree, it will be sufficient; but on no account must they be earthed up, neither must they in planting be put any deeper into the ground than they have already been growing in the seed-bed. If the weeds grow a little they will rather protect the young trees than otherwise; if those within a few inches are cleared away immediately next the plant it will be sufficient. At the end of the growing season it will be desirable to see how many plants have missed, and to mend these blanks with two-year-old plants; indeed, unless you have been unlucky, the samples of plants not used last planting, and of course replanted at the time in some waste place or in nursery beds, will mend all that will have died, under good management. The mended plants must be well watered in. In the spring of the second year let the hoeing be repeated, so as to give the young plants a foot of clear surface, or if the weeds be noxious clear the ground all over. It is very desirable in bleak situations to let the young plants have protection, but if the ground be inclined to be foul, which is not very likely when poor, it is better to clear all away the second year, and for the future. The plantation will soon be making its growth, and when once the plants get hold of the ground, they make comparatively rapid progress. When these plants have become large enough to make dahlia stakes they are saleable; when they are large enough for hop-poles they are more so. As soon as it is seen which makes the better progress, the larch or the Scotch, you may make up your mind that the other shall be cut down first; and as soon as they are large enough to fetch any money, sacrifice them all, at any rate as fast as you can get a market, or bring them into use. The plants will even then be only a yard apart, quite as near as hop-poles should be grown; when these have become large enough to market begin to market them, taking every alternate one out in the row.

PYRUS JAPONICA.—Complaint is made by a correspondent that he cannot find the name of this popular and very beautiful plant in Lindley and Paxton's catalogue, and that it

cannot be mentioned among *Pyrus* by any other specific title, because there is not one that is described as having a coral or blood-coloured flower. Really, if we were bound to make everybody understand that compound of facts and fictions, we should have a task. We quite agree with our correspondent that it is not there, and moreover that there is not a clue by which anybody can find it in the work. Those who know that it is of the quince genus may think of looking among the *Cydonia*—may perhaps fancy they have got it at *Cydonia japonica*, but here a man may doubt from the inaccuracy with regard to the origin or introduction. Don's *Hortus Cantabrigiensis* has *Pyrus japonica*, introduced from Japan in 1792; consequently no one has a right to suppose that *Cydonia japonica*, introduced in 1815, can be the same thing; however, we have no doubt it means the same as *Pyrus japonica*, and that neither Paxton nor Lindley knew that the plant had been in the country twenty-three years before the date they assign, and had been published to the world eight years before they thought it was introduced. It is the notice of all the changes which the squabbles of botanists, and the improvement of the science, and the spread of singular dogmas have made in the names long familiar, that renders the last edition of *Hortus Cantabrigiensis* the most valuable of all the so-called Botanical Dictionaries, Encyclopædias of Plants, *Hortus Britannicus*, and similar works; it is the plainest, cheapest of its form, most comprehensive, ever published; and in it we may find not only the familiar names, but all changes, ridiculous and otherwise, that have been made by splitting genera, and confounding species with mere seedling varieties. We beg, however, to say, that the nurseries do not go on at quite such a mad pace as botanists; any of them will know what *Pyrus japonica* means, though some of them adopt among the various subjects the more novel names, upon the mistaken notion that people will buy the new name when they have already plants of the old.

THE THINNING OF FRUIT.

So far as we have yet observed in public and private gardens, very few gardeners pay half enough attention to the thinning of fruit; and this appears the less excusable, because they practise it with a few choice wall fruit, and therefore show that they know the efficacy of it. If fine fruits are required, it should be practised all through—gooseberries, currants, apples and pears, raspberries and strawberries, all alike improve by lessening their numbers, yet how rarely does the thinning go beyond the peaches, nectarines, apricots, and fruit on the wall! But if we come to the orchard, we see

trees absolutely breaking down with their loads, thus deteriorating all the fruit for the present season and destroying the next year's crop, but not an effort is made to avoid the double evil. Upon what principle the gardener allows all this, or by what fatuity he overlooks it, we cannot divine. He may fancy the fruit not worth the trouble, but whatever is worth growing is worth growing properly, be it what it may. We believe the great secret to be, that the gardener has no kind of discredit for the failures in the orchard, and therefore is careless about the produce. If there be any, he gathers it at a proper time; and if there be not, he merely says there is a failure, and there ends the matter. If, through his own neglect, the apples are deformed and blighted or small, he merely reports it as he would a hail or a thunder-storm, or any other mischievous visitation, and no more is said or done. But attention in an orchard is required, and well pays itself. Much of the uncertainty as to crops, and all the uncertainty as to quality, can be counteracted by ordinary attention; not by letting trees grow their own way, never looked at but when the fruit is on them, and never touched till the crop is ready to gather, but by paying exactly the same attention in the removal of useless wood and superabundant fruit as would be bestowed on a wall fruit-tree, by thinning the fruit as soon as it begins to swell, and the good can be seen and distinguished from the doubtful, and the blighted, or deformed; but the attention must begin at the pruning, it is of no use getting up into a tree whose head is as close as a furze bush. The thinning in such a case would be an endless task, and it is not a prudent time to cut away branches; something may be done, it is true, but the good that could be accomplished would be scarcely worth the trouble, because if the quantity of fruit were much lessened the branches would grow the faster, and there being three times as many as there ought to be, it would be only encouraging more twigs and leaves. Thinning the fruit, therefore, although one of the most necessary operations that can be performed under proper circumstances, would be lost time if the tree were not prepared. Let every orchard tree be divested of its weak shoots and useless twigs; let every branch that is in the way of another come away, or be left and the other cut off; wherever two are too close or cross each other, let that which is of the lesser consequence be removed; in short, completely open the head of the tree, that the sun and air may reach even the lower branches; and, keep down the tops. Nothing is more senseless than to allow trees to grow higher than they can be reached. The lower part of the plant is always the worse for it; the fruit within

reach is scanty and thin, at the top fine and plentiful; but they would be just as plentiful if the top were half the height, and the lower half of a high tree would produce fine fruit. In pruning trees regard should always be had to the convenience of gathering; no branches should be permitted to grow where they cannot be reached. When this is attended to the thinning of the fruit will greatly increase the size of those left on to grow; and the very trees that have for years brought distorted and blighted fruit, or none at all, will produce fine crops of excellent produce, and if not too much taxed with fruit any one year, there will be little chance of a failure at any time.

THE JABUTICABA.—The Jabuticaba is the fruit of a species of *Eugenia* (*E. cauliflora*, Martius) which grows wild in the woods of the south of Brazil, and is also cultivated in most of the gardens in the diamond and gold districts. It is of a black colour, about the size of a green-gage plum, of a pulpy consistence, and very refreshing.—*Gardner's Travels*.

CABBAGE PALM.—As a vegetable, we had a dish of cabbage palm (*Euterpe edulis*) which is very tender and most delicious, tasting not unlike asparagus.—*Ibid*.

IMBUZEIRO.—This is the produce of a large tree called *Spondias tuberosa*, which produces abundantly a fruit about twice the size of a large gooseberry, of an oblong shape and yellowish colour when ripe. Beneath its coriaceous skin there is a juicy pulp, of a pleasant sweetish acid taste. This fruit is only fit to eat when it is so ripe as to fall to the ground, when a great quantity can be eaten without inconvenience. A dish much esteemed in the Sertão, called Imbuzada, is prepared with milk, curds, sugar, and the pulpy part of this fruit. The tree throws out horizontal roots, which do not penetrate very deeply into the earth; and upon these are found at short distances round black-coloured tubers about eight inches in diameter, consisting entirely of a white cellular substance, which is full of water; these, which are evidently intended by nature to supply the vegetation of the tree during the dry season, are often dug out by travellers for the sake of the water they contain, each tuber yielding about a pint of excellent quality.—*Ibid*.

PITOMBIERA.—A wild fruit common about Cachoeira, Crato, and Pernambuco, produced by the *Sapindus esculentus*, St. Hilaire, a tree growing to the height of from thirty to forty feet. The fruit is produced in large bunches resembling in size the common grape; the outer covering is hard, but the embryo or kernel is covered with a thin transparent sweetish acid pulp, which alone is eaten. The kernels are said to poison turkeys if eaten by them.—*Ibid*.



DIELYTRA SPECTABILIS.

Dielytra spectabilis, De Candolle (showy Dielytra).—Fumariaceæ § Fumariææ.

This exceedingly graceful plant is one of Mr. Fortune's introductions from the gardens of the north of China, where, in the fairy gardens of the mandarins, he found it to be very extensively cultivated. The species appears to be recognised as a native of Siberia, and was first made known to European botanists "by the Russo-Siberian, De Karamyschew, who, studying at Upsal, communicated it to Linnæus." By Linnæus it was called *Fumaria spectabilis*, and it has obtained other names from other botanists, namely, *Corydalis spectabilis* (Persoon), and *Capnorchis spectabilis* (Borkhausen). From the Chinese gardens Mr. Fortune introduced it to English gardens, in 1846, and it proves to be a very beautiful species, the handsomest of all the Fumeworts; it is, moreover, believed to be quite hardy, though, from its scarcity, this has not yet, as far as we know, been fully tested.

Mr. Fortune tells us that its Chinese name is *Hong-pak-Moutan Wha*, or, the "red and white Moutan flower." "The Chinese botanists," he adds, "do not take the characters of their genera from the flowers, as we do, but from the general habits and appearances of the plants. In this instance the leaves are not unlike those of the Moutan pæony; the flowers

are red and white; and hence the Chinese call it the "red and white Moutan flower."

The plant is an herbaceous perennial, growing from a foot and a half to two feet in height, and furnished, at intervals, along the stem, with leaves of a compoundly ternate character, a good deal resembling—though smaller—those of some kinds of pæonies. Towards the top of the stems are thrown out three or four axillary racemes of flowers, and these assume a gracefully drooping aspect, the flowers all depending from the lower side; these racemes are from four to six inches, or more, in length. The individual blossoms are fully an inch in length, and nearly three quarters of an inch wide, and consist of two saccate petals, of a charmingly delicate rose colour, between which intervene two narrow ones, which are white with a purple tip, and project beyond the others; this peculiar form will be recognised in the engraving.

Mr. Fortune speaks of this species as being exceedingly fitted to be used as a pot-plant in rooms, on account of its extremely graceful habit, and from its blooms remaining fresh for a long time. He states that he has, in Chusan, had it for three weeks standing upon his table, after it had been dug up out of the garden, during all which time it retained its freshness and beauty.

This species of *Dielytra* has the recommendation of being easily grown. It will thrive in any soil of light loamy texture, and does not require a large pot; the pots, however, should be well drained. The stems of the plant die down after flowering, and the roots then naturally remain dormant until the following spring. Whilst in this state it should be kept moderately dry. In the spring, when growth recommences, it will require more water; and at this time may be divided with advantage for the purpose of increase. Cuttings of the young shoots in the earlier

stages of their growth make roots with freedom if planted in light sandy soil, and placed where there is a slight degree of bottom heat. When kept in a pot it should be grown in a cool airy part of the greenhouse; where, however, it may be sheltered from strong currents of air, which seem to be inimical to it. When more plentiful than at present, so as to admit of its being planted out of doors, it should be placed in a situation sheltered from rough winds, and where the soil is thoroughly drained of superfluous moisture. Any light moderately rich soil will do for it.

THE VACCINIUM, OR WHORTLEBERRY.

ALL the species are shrubs of considerable beauty, bearing flowers somewhat alike, and without much diversity of colour, but still affording variety of habit, and, on the whole, very ornamental; many of them are also capable of producing fruit of the character of the common Whortleberry (*V. Myrtillus*), which is found in large tracts in many parts of this country.

The *Vacciniums* belong to the natural order *Ericaceæ*, and to the Linnæan Oct-Decandria Monogynia. The species which have been introduced are rather numerous, as the following enumeration of them will show:—

V. albidiflorum (white-flowered Whortleberry) is a small deciduous shrub, with spreading branches. It has oval-lanceolate leaves, obscurely serrulated on the margin, and slightly hairy beneath; the flowers are broadly oval, and they are borne in somewhat corymbose drooping racemes from the leafless branches, in May. It seldom exceeds two or three feet high. Native of North America.

V. angustifolium (narrow-leaved Whortleberry) is a deciduous undershrub, growing from a foot to two feet in height. The leaves are lance-shaped, nearly entire, and downy beneath; the flowers, which are remarkable for their flagon-shaped appearance, and their pale yellowish green colour, tinged with red, are produced mostly solitary; the fruit is large and globose, blackish purple, and highly esteemed by the inhabitants of the countries where the plant is indigenous; they are called bluets. It flowers in April and May. Native of high alpine woods in various parts of North America. It is called *V. myrtilloides*.

V. arboreum (tree Whortleberry) is a large-growing deciduous shrub, attaining ten feet and upwards. The leaves are ovate acute; the flowers are acutely bell-shaped, white; sometimes axillary, and then solitary, but sometimes terminal and racemose; the berries are globular and black, the flesh being almost dry. It flowers in May and June. Native of dry woods and rocky banks of rivers in

many parts of North America. It is called *V. diffusum*.

V. Arctostaphylos (bear's-grape Whortleberry) is a deciduous shrub, growing from eight to ten feet high, and worthy of cultivation for its fruit. The leaves are elliptic-acute, hairy beneath; the flowers are bell-shaped, of a dirty white tinged with purple, in lateral racemes of eight to ten flowers from the preceding year's wood; the fruit is grown in very great abundance, as it is of agreeable taste, and makes excellent tarts. It flowers from April to June. Native of the shores of the Black Sea.

V. buxifolium (box-leaved Whortleberry) is a handsome little evergreen shrub of six inches high, with obovate crenated leaves, smooth on both surfaces; the flowers are roundish-ovate, white, delicately striped with red, produced in June. It is a native of North America. It is also called *V. brachycerum*; probably it is a variety of *V. Vitis Idæa*.

V. canadense (Canadian Whortleberry) is a dwarf evergreen shrub, with lanceolate leaves, acute at both ends, and terminal racemes of bell-shaped flowers, white, tinged with red; the berries are blue-black, and agreeably tasted. It flowers in May and June, and is a native of Canada.

V. caracasenum (Caracas Whortleberry) is a small evergreen shrub, with elliptic-acute leaves, and crowded racemes of bell-shaped white flowers, blooming in May and June. Native of the southern declivity of Mount Silla de Caraccas.

V. cæspitosum (tufted Whortleberry) is a little deciduous shrub, growing a few inches only in height; the leaves are somewhat wedge-shaped, obtuse, and serrated; the flowers are of a short pitcher shape, growing singly, white, tinged with blush; the berries are globose, blue-black, with a glaucous bloom. It blooms in May. Native of North America.

V. corymbosum (corymbose-flowered Whortleberry) is a tall-growing deciduous shrub, sometimes attaining seven or eight feet high;

the leaves are elliptic-acute; the flowers are somewhat pitcher-shaped, white or reddish; the berries are black and insipid. It flowers in May and June. Native of swamps and wet woods of North America. There are some varieties; *virgatum*, two feet high, with pale red flowers; *fuscatum*, flowers striped red and white; *angustifolium*, with lance-shaped leaves and white flowers. In the Duc d'Arenberg's garden at Enghien, *V. corymbosum* is cultivated for its fruit, which is used like that of the cranberry. It is known also as *V. amœnum*, *V. disomorphum*, *V. elevatum*, and *V. album* of some.

V. crassifolium (thick-leaved Whortleberry) is a low trailing deciduous shrub, with elliptic crenated leaves, and corymbose racemes of bell-shaped flowers, which are prettily variegated with pink and white. It flowers in May and June, and is a native of Carolina.

V. dumosum (bushy Whortleberry) is a deciduous low bushy shrub, growing from two to three feet high; the leaves are obovate; the flowers are in racemes, rather large, bell-shaped, white, tinged with pink; the berries are black and globular. A native of dry sandy woods in North America. It flowers in June and July. It is called by some *V. frondosum*, and *V. hirtellum*. There is a variety which grows about six inches high, called *humile*.

V. elongatum (elongated Whortleberry) is a deciduous shrub, growing three or four feet high; it has elliptic-lanceolate serrulated leaves, and bears corymbs of white flowers in July and August. Native of North America.

V. frondosum (frondose, or leafy-branched Whortleberry) is a deciduous shrub, growing three feet high, and bearing loose racemes of small, nearly globular, greenish-white flowers. The leaves are obovate; the berries are large, globular, of a blue colour, and eatable; and they are called by the native people of America blue tangles. It flowers in May and June, and inhabits open woods in North America. Known also by the name of *V. glaucum*. A variety of this plant, called *venustum*, has pink flowers.

V. galezans (gale-like Whortleberry) is a low deciduous shrub of about two feet high; the leaves lanceolate, wedge-shaped; and the flowers, which are small and ovate, are of a greenish white colour, and are succeeded by small, black, globular berries. It flowers in May and June. Native of shady woods and swamps in North America. Called by some *V. galiformis*.

V. glabrum (smooth Whortleberry) is a small deciduous shrub, with elliptic leaves, and bell-shaped rose-coloured flowers in July and August. Native of North America.

V. grandiflorum (large-flowered Whortle-

berry) grows a foot and a half high; it has deciduous, elliptic, cone-shaped leaves; the flowers are white, somewhat tube-shaped, in terminal racemes. It flowers in July and August. Native of North America.

V. humifusum (trailing Whortleberry) is a low, creeping, evergreen shrub, from North America, with ovate, acutish, ciliated leaves, and white, drooping, bell-shaped, solitary flowers. The fruit is edible and well-flavoured. It flowers in May and June. Native of North America.

V. ligustrinum (privet-like Whortleberry) is an erect deciduous shrub, from two to three feet high, with lance-shaped, finely-serrated leaves, and longish-ovate, purplish-red flowers, growing in tufts; the fruit is black. It blooms from May to July. Native of dry woods and mountains in North America.

V. marianum (Maryland Whortleberry) is a shrub growing from three to four feet high, and having deciduous, elliptic, denticulate leaves; the flowers are white, ovate, and open in May and June. Native of North America. It is the *V. marilandicum* of Messrs. Lodiges.

V. minutiflorum (minute-flowered Whortleberry) is a low deciduous shrub of about a foot in height, with small ovate leaves, and white cylindrical flowers, in racemes, produced in July and August. Native of North America.

V. Myrsinites (myrsine-like Whortleberry) is a beautiful little evergreen shrub, with oval shining leaves, and tufts of oblong-ovate purple flowers, produced in May and June. Native of dry sandy woods in North America. There are two recorded varieties, *lanceolatus* and *obtusius*, which differ in the foliage, as implied in the names.

V. myrtifolium (myrtle-leaved Whortleberry) is a low creeping shrub, from Carolina, with oval shining leaves, and axillary racemes of bell-shaped white flowers in May and July: the berries are small, globose, and black.

V. Myrtilus (common Billberry, or Blea-berry, or Whortleberry) is a low deciduous shrub, varying from six inches to two feet high. The leaves are ovate; the flowers solitary, globose, of a delicate waxy pink hue. These are succeeded by roundish blue-black berries, about the size of currants, which are much used in different parts of the country. The berries are eaten in tarts, pies, or puddings, or with cream, or they are made into jelly. The juice has been employed to stain linen and paper purple. The plant abounds on heaths, stony moors, and mountain woods, throughout most parts of Europe, especially northwards; and also in the north of Asia and Africa; and at Nootka Sound and Nova Scotia in America. It blossoms in May.

There is a white-fruited variety called *baccis albis*; and in the western parts of North America a variety exists that grows seven or eight feet high.

V. nitidum (glossy-leaved Whortleberry) is a decumbent shrub, with elliptic-obovate, acute, crenated leaves, and terminal racemes of cylindrical pinkish flowers. A native of Carolina, flowering in May and June.

V. ovatum (ovate-leaved Whortleberry) is a small handsome evergreen shrub, with ovate, serrated, leathery, smooth leaves, and short racemes of pinkish bell-shaped flowers in May. It is found on the banks of the Colombia, and on the north-west coast of America.

V. padifolium (bird-cherry-leaved Bear's-grape, or Whortleberry) is a deciduous shrub, from six to ten feet high, from Madeira. The leaves are ovate-lanceolate; the flowers are ovate, in lateral racemes, pale greenish tinged with purple; they bloom from June till August. The berries are black, juicy, eatable, and gratefully acid.

V. pallidum (pale-flowered Whortleberry) is a low deciduous shrub of about two feet high, from North America, with ovate leaves, and racemes of bell-shaped white flowers in May and June.

V. resinorum (resinous Whortleberry) is a deciduous shrub, growing two feet high. The leaves are obovate-lanceolate, bluntish; the flowers are greenish yellow, in short racemes; the berries black and eatable. It blooms in May and June. Native of woods and mountains in North America. Formerly called *Andromeda baccata*. There are two varieties, *rubescens*, with reddish flowers, and *lutescens*, (*parvifolium* of some,) with the flowers reddish yellow.

V. stamineum (long-stamened Whortleberry) is a low deciduous shrub growing from one to two feet high. The leaves are elliptic acute; the flowers are small, white, in racemes, produced in May and June, and succeeded by greenish or white fruit, called deer-berries. It is from North America. There is a dwarf variety called *album*, from the woods of Mexico. By some it is called *V. album* and *V. elevatum*.

V. tenellum (slender Whortleberry) is a much branched deciduous shrub, having ovate-lanceolate acuminate leaves, and dense tufts of pale red or white bell-shaped flowers in May, succeeded by large bluish-black sweet berries, very agreeable to the palate. It grows on dry gravelly hills, in North America. Known also as *V. pennsylvanicum*.

V. uliginosum (bog Whortleberry, or great Bilberry) is a deciduous shrub, attaining about two feet in height. The leaves are obovate; the flowers narrowish ovate, flesh-coloured, blooming in April and May. The berries are

large, juicy, black, and agreeable, but inferior in flavour to those of *V. Myrtillus*. "Eaten in large quantities, they occasion giddiness and headache." In France they are used to colour wines red; in Sweden and Siberia they furnish a volatile and intoxicating ardent spirit. The leaves, added to *Lycopodium alpinum*, produce on infusion a yellow dye for staining woollen fabrics. It inhabits many parts of the north of Europe, Asia, and America, occurring in marshy mountain heaths and alpine bogs. Formerly called *Myrtillus grandis*.

V. Vitis Idæa (Mount Ida Whortleberry, or Cowberry) is a low evergreen shrub, with a creeping root, growing in dry barren stony woods, and varying from six inches to a foot in height. The leaves are obovate and leathery; the flowers in terminal racemes, bell-shaped, pale pink; the berries blood-red, acid, austere, and bitter. It blooms in May and June. It occurs in the north of Europe, and in North America. The berries are scarcely to be eaten raw, but they are made into pies; and in Sweden a jelly is made from them, which is eaten with all kinds of roast meat, and is preferred to currant-jelly as a sauce for venison. In Sweden this preserve is considered good in colds, sore throats, &c. In Siberia, both a spirit and a wine are produced from them. Sweetmeats also are made of them, with honey or sugar, and much used in Moscow at balls. The berries form an important article of commerce in the seaports on the Gulf of Bothnia, whence they are sent to Europe with cranberries. The *V. Vitis Idæa* is one of the few neat-growing plants which, when the soil and situation are suitable, might be substituted for box as an edging to gravel walks; its glossy foliage and pretty flowers and fruit render it more varied and beautiful as an edging than box, but it does not bear to be clipped, and therefore is not so well adapted for a small and neat edging.

There are many species of *Vaccinium*, both hardy and half-hardy, that have not yet been introduced to this country.

The *Vacciniums* belong to those plants which are known as American shrubs, which are most readily cultivated in what is called heath-soil, or peat-earth, or else in sandy loam. Like most other American plants, they attain their greatest degree of perfection in situations where the subsoil is cool and moist during the summer, without being subjected to excess of moisture in the winter season. Such a position is usually afforded in the lowest parts of a pleasure-ground, if these parts are at all properly drained. Wherever the American plants are held in estimation, and cultivated to any extent, it is quite desirable to form an artificial depression of

the surface sufficiently large to hold the whole collection; and the surface of this depression may be varied by gentle undulations, and blend easily with the surrounding surface. The plants should then be disposed in groups, planted, not promiscuously, and in a miscellaneous manner, but each principal group or genus assigned to a bed or clump appropriated in situation to both the number and size of the plants. When such an arrangement as this is adopted, the little peculiarities which the plants require can be properly attended to. Thus, for example, in the case of the *Vacciniums* now under notice, some few of the species naturally affect dryish spots: these could be placed in the highest parts of the undulated surface of the bed; others, and these the greater number, are found in low damp places, and could as easily be placed in the lowest parts of the bed. In this way, the little peculiarities of each would be attended to; and the result would be, that each and all would grow with much greater facility than if otherwise treated, and would display to greater advantage those little characteristic differences on which much of the variety and interest of a collection of shrubs, no less than of other objects of attention, will be found mainly to depend.

In the primary formation of the beds, there are two courses which present themselves, varying according to the nature and character of the soil. If the soil and situation be a wet one, besides the necessary drainage, which should be sufficient to prevent altogether the stagnation of water, the addition of soil necessary for the plants to grow in should, for the most part, be made on the surface of the original soil; and thus the new materials would be formed on a fresh and higher level: this of itself would prevent much of the injury that might arise from the natural dampness of the situation. If, on the other hand, the situation happens to be a dry one, then the soil should be excavated sufficiently deep to form the new bed of earth for the plants. This stratum of earth should average about two feet deep; more than this is unnecessary, and would incur a needless expense; less might do for a time, and altogether for the smallest kinds, but the general effect would not be of so permanent and lasting a character as when the border is at first made of a fair average depth: this depth is already stated to be about two feet.

The best time to plant is in September or October, or, if neglected then, in March or April, choosing, in either case, calm, open, and genial weather; cloudy and misty it may be, but by no means frosty or windy; the latter, especially, by drying up the juices of the plants when they are not in a situation to

replenish them, is at all times injurious, and sometimes fatal. Unquestionably, early in the autumn is the best time for removing the plants, as they then become established at the root before they are affected either by the cold of winter, or the heat and drought of spring.

The *Vacciniums* admit of propagation by seeds, by root suckers, or by layers of the creeping stems of the decumbent ones, and the branches of the erect-growing sorts. The seeds should be treated as follows:—In the autumn, or as soon as they become ripe, they should be separated from the pulp with which they are enveloped in the berry, and sown in shallow pans of sandy peat soil, with a slight covering of the same, made very sandy: these pans are to be placed in a cool frame, and kept regularly and evenly moist. An excellent plan to effect this, without requiring so frequent an application of water, which is liable to wash away the fine seeds, is to cover the surface of the soil with a layer of damp moss, which prevents evaporation, and maintains a regular and even degree of moisture. Of course, this covering must be removed when the plants make their appearance. As soon as the young plants are about an inch high, they should be transplanted thinly into other pans; and after being well established in these, may be planted out in the spring months, retaining a "ball," or mass of earth about their roots in removing them. This is a tedious process, however, to secure plants, which are much sooner obtained by layers or suckers, neither of which will require further explanation in this place.

The *Vacciniums* may be said to have a double claim on the attention of cultivators, for they are interesting both as flowering and as fruit-bearing plants. Many of the species might be very successfully grown for their fruit; and though, in point of economy and productiveness, they might not equal some of our commonly cultivated small hardy fruits, yet the variety they would afford at the table of those who prize luxuries of this class would be alone sufficient to recommend them. They are, moreover, exceedingly wholesome fruits, and make excellent tarts. Some of the kinds, which cover extensive tracts of land in this country, are annually brought into the markets, and meet with a ready demand. The kinds which appear most likely to admit of profitable cultivation are the following:—*V. Myrtillus*, *V. uliginosum*, and *V. Vitis Idæa*, which are native plants, and cover extensive tracts, bearing fruit abundantly; *V. angustifolium*, *V. tenellum*, *V. frondosum*, *V. Arctostaphylos*, *V. padifolium*, and *V. canadense*, which all of them bear fruit of tolerable size, and eatable. No doubt these

plants also might be greatly improved by cultivation, as other fruits have been. This can only be effected, however, by a careful and continued course of raising them from seeds, propagating only from those which, time after time, manifest superior qualities either of size, flavour, or productiveness.

Where the cultivation of fruit is an object, the soil in which they are grown ought to be enriched by the addition of materials of a more stimulating nature than peat-earth alone; thus, a proportion of one-fourth rich friable loam and

well decayed leaf-mould, mixed in about equal proportions, will induce a much greater degree of vigour in the plants, and improve the size of the fruit. To the same end also, during the growing season, if the weather is dry and the soil is likely to become parched, liberal waterings with rain water should be given, so as to keep the soil moist; and this will materially assist the swelling of the fruit. An occasional application of very dilute manure water, in a clear state, will also be beneficial for the same purpose.

EMIGRATION AND COLONIZATION.

WITHOUT singling out one of the many plans of emigration and colonization that have been promoted during the last century, there need be no apology for saying, the best has been inadequate, and some of the present schemes, though varied, are open to the same objection as their predecessors. A colony, to answer well, should consist of healthy, hard-working, cleanly, creditable persons, capable of labouring at some one or other of the many trades and callings that are called into use in all communities, but especially in new countries. The number of those of each trade and calling should be regulated as nicely as the officers in an army, or the different trades in a ship. The higher classes do not consider properly the wants of the lower classes. They take infinite pains, they make many inquiries, they waste a good deal of time upon the subject, but they lose sight of one great point; and to that cause may be attributed all the evils that this country has suffered, and many of the failures which our colonies have experienced. Hitherto the outlet by emigration has taken our best men and left us the worst; and so long as it shall be made a condition that the emigrant shall possess even a five-pound note of his own, so long will emigration fail to produce the slightest benefit at home, or to do much good abroad. There should be conditions attached to the shipping of any emigrant—age and health of himself, wife, and family, character, and, if you please, religion, so far as each group intended for a particular spot should be alike in that particular; but we would have no money qualification. The workmen who are prudent enough to save money, should remain with the mother country. We would certainly not help, with even a cheap instead of a dear passage, any who have money of their own. Let such people go, if they will go; but not a sixpence would we give out of the imperial treasury, nor out of any charitable fund, to help them to leave their country. The first colonists of any place ought to be outfitted as completely as possible, and provision made for a few months'

want of supplies. Let those that are sent out free be fitted out free, but let them be just such as are wanted, and none other. When a ship load, or rather an expedition, arrives out, let every man be as dependent as a soldier until the colony has advanced a little. As we have hitherto conducted these matters, they have no sooner got to their destination than each man has a will of his own. There was no common cause among the labouring classes except those bound to particular masters, and therefore engaged for them. Now our notion is that, notwithstanding all that may be done otherwise, there should be—a scheme of communism, we were going to say—a complete community, as neatly adjusted as the crew of a ship, and all done at home; every man should know his place and his duty; every superior should know his authority. It should have its little municipal government, perfect in itself, the entire being only subject to the colonial government,—precisely in the same way as if we were to found a new city in the middle of Salisbury Plain, or a new town on some of the many wastes that may be found in England. Let the mayor and aldermen, or the town-council, be all appointed here: let everything be organized; the land granted and named, the spot known, and the chief buildings planned, and, if necessary, taken out half-built. But it will be said, no doubt, that men will not be controlled; that if they can engage themselves to a master, they will; but free emigrants will not be ordered here and there. This has been the evil; Government has always made it a condition that men shall have so much money before they shall have peculiar privileges: whereas it had been far better for those who go with property, if the government outfitted and gave passages to persons without a penny, conditionally that for one, two, or three years, they are under the command of the superiors, whatever they may be called, who should put them to their various kinds of work, under competent persons, and have the same control over them as the officers have over the soldiers in a regi-

ment, or the sailors in a man-of-war crew. We would far sooner see a man bound to obey for a given time, than go out with a few pounds of his own ; because it is quite certain that many colonies have suffered deeply for want of labourers and mechanics, while thousands from England would be glad to go. Even at this instant of our writing, labour in the colonies is scarce. Why not send out a thousand men, of good character, who have not a shilling of their own, bound to work two years, or one year even, for Government, if their expenses cannot be paid ; but free to take an engagement the moment they get over, on giving security for the repayment of the estimated cost to Government ? Say that the passage to some of the colonies now wanting workmen and labourers of all kinds, and the keep of the man, is worth twenty pounds, —for one sum is as good as another. The supposed number of good men, of right age, might be found—indeed, we may say picked, if the possession of money be not requisite ; let them enter into an engagement to work for the government two years to repay the money, being found in rations during the time ; but let it be understood, that on the payment of this twenty pounds, even if on landing, they are free. The working of this would stand thus :—A. wants a man ; he finds one among them that will suit him ; he only has to make his bargain, advance the man 20*l.*, and he is at liberty to fulfil the engagement : but suppose there be some left, there might be the means of employing them until they were required ; and as every body would apply to the Government when they wanted hands, matters would easily be arranged to facilitate the supply of labour. The same facilities should be afforded for the supply of female servants. Provide them a free passage, and engage to keep them till they found places. Those who wanted servants would apply where they were to be had ; and the colonists, who are now all masters and mistresses, or who at least are both ill and dearly served, would be benefited beyond measure. We have only jumbled together a few hints here, but our principal object is to show that Government only half does the thing, and had better almost leave it alone. Let them attend to the one thing needful—character ; and we would sooner see a thousand men who could not raise a sovereign among them all, sent out with a free passage and certain keep for a time, than as many who had saved money. If those labourers who have saved money wish to emigrate, let them ; but do not give them a shilling's worth of encouragement, or render their passage-money less : that is not the class we want to get rid of. Let the capitalists who are to have grants of

land go if they will, and take hundreds in their train ; but the mechanic who has saved money is of the class we require at home. We would not stop him against his will, but we would certainly not do an act that should tempt him. He is not the sort of person to whom a free passage or a cheap passage should be given. We could certainly spare a few thousand gardeners, and much good would be felt to arise from the exportation ; there are too many by one-half, and every day adds to the number. Almost every youth at school and at home is taught gardening, and it is a general impression among a large class that all men ought to be gardeners ; but gardening is becoming like music, every body is more or less an amateur, and many amateurs completely beat the professionals. In short, the professional and the amateur class can now only be distinguished as those who get their living by it and those who do not ; but there appears to be no lack of master husbandmen and gardeners. It is only the labourers that are scarce, and these Government ought to supply. But the truth is, that all the colonies are too full of agriculturists, and they want mechanics. The produce is too plentiful already. We hear of sheep being killed for their fat and wool, which are easily exported, and the meat for the most part wasted. Is it not a pity that there is not a population to consume some of the mutton ? Yet the colonists are complaining of want of help, want of servants and labourers, while in the mother country the very class that are so scarce abroad are almost devouring each other. We have merely dealt in general terms. It was not our object to get into detail. We have always felt that Government ought to look to men and not money ; that the authorities ought not to be fighting for the pounds, shillings, and pence, but to drop emigration as a Government concern altogether, or to make it really and truly a beneficial measure, by carrying it into effect upon a liberal scale. As we have said before, let the fitness of a man for emigration be the only consideration ; for unless he is able by his own exertions to maintain himself and help others, he is of no use there, even if he has a little money ; whereas, the man who can supply the labour that is wanted is of the greatest service to those already located, and the supply of labour ought to be sufficient to keep it a little lower in the market. There is scarcely a trade or calling in this country that is not overrun with men idle against their will, and these are precisely the sort to send away, though they have not a shilling beforehand, and could not by any means provide for their passage, nor make their way out without some assistance.

RHODODENDRON BARBATUM.

Rhododendron barbatum, Wallich (bearded Rhododendron).—Ericaceæ § Rhododendrea.

This very distinct Rhododendron flowered for the first time in England during the spring of 1848, at Eaton-hall, in Cheshire, the seat of the Marquis of Westminster. We find the name inserted in the garden catalogues as having been introduced in 1829, and under this name a Rhododendron was figured many years since in Loddiges' *Botanical Cabinet*, but probably none of these indicate the plant here alluded to; certainly Mr. Loddiges'



figure does not represent it. Our sketch is derived from a good wood-cut engraving published in the *Journal of the Horticultural Society*, and prepared from a beautiful drawing, taken from the plant at Eaton-hall, and presented to the Society by the Marchioness of Westminster.

Like the other familiar species of Rhododendron, this is an evergreen shrub, of stout and free-growing habit, with elliptic-lanceolate leaves, exhibiting the same general appearances as those of other Rhododendrons. The flowers are of a beautiful rose colour, and almost without spots; they grow in a rather small and very close head at the end of the shoots, and are remarkable for their peculiar form, which is very shallow, and much more nearly circular in the outline than is the case with the blooms of any of the familiar kinds; they are, as is usual, divided into five lobes,

but the lobes are equal in size, and regular in form, producing a corolla which bears little superficial resemblance to that of the ordinary Rhododendrons. Both their form and colour serve to render them attractive.

The history of Lord Westminster's plant is thus given in the journal already referred to, in the report of the meeting at which the drawing was exhibited:—"It was stated to have been obtained from the north of India, but, unlike the Indian species, which generally have loose heads of flowers, if the Ceylon *R. zeylanicum* be excepted, its flower heads were close and compact, the individual flowers being short and round, and freer from spots than most other Indian kinds."

It will form a fine conservatory shrub, but probably needs very little, if any, protection from the weather. In its culture exactly the same mode of treatment should be adopted as is given to the other kinds. It is a native of Nepal.

GARDENING MEMORANDA FOR SEPTEMBER.*

THE height of the Dahlia bloom. The season of fruit gathering and storing, the period for looking over all the greenhouse plants, trimming them, stirring the surface of soil in the pots, clearing them and getting them back into their winter quarters. In this we must not fall into the common error of over-crowding houses. Nothing conduces more to the ruin of a plant than putting too many into a given space; it impedes the circulation of air, and the admission of light, than which no two sources of mischief can be more fatal. Give them plenty of room; no two plants ought under any circumstances to touch each other. All the bottoms of the frames ought to be hard and impervious to wet, that the water given to the plants may not soak in; and they should slope a little, that it may run off. Layers of Carnations and Picotees should be now cut from the parent plants and be potted in good loam, in pots, size 48, a pair in each pot, and be placed in frames for the winter. The Pinks that are potted should be also put under glass, or for want of that convenience, plunged in beds of coal-ash, sawdust, or sand, in such way that they may be protected with mats, or covered with long loose litter. All the pipings not bedded out for bloom, or potted for storing, ought to be put into store beds three inches apart all over, to grow into strength and be ready for

* A very elaborate and complete Calendar of Gardening Operations for September is published in No. 33 of the Horticultural Magazine.

sending out or making beds, between this and the spring. The Roses, and other trees that have been budded and grafted, should be untied and released of their bandages, clay, &c., and if necessary by the growth of the buds, the growing shoots should be tied, to secure them from wind. Roses may be potted for forcing and plunged into beds, or put into cold frames previous to their removal into warmer berths. The conservatory should be supplied with plants in flower from all the available sources, and preparations made for forcing various plants to keep up the brilliance of the house. Rhododendrons, azaleas, dwarf almonds, double flowering peaches, rhodoras, Persian lilies, Gueldres roses, Deutzias, as well as pinks, stocks, mignonette, double wallflowers, and other spring-flowering plants should be potted to be forwarded in their bloom, and according to the time they are wanted should be ready to take into the greenhouse, stove, or forcing house. Cleanliness must be observed in all the depositories for plants; no rotten leaves, no dampness must be allowed. Heaths that have been bedded out must be potted up for the winter protection. Flower beds whose contents are tender, must, when the frost cuts them up, be dug up; and dwarf evergreens in pots should be placed therein to keep up their best appearance during the winter, and crocuses, hyacinths, jonquills, narcissuses, irises, and other bulbs that flower very early, should be planted between them, that there may be the appearance of finish to the beds always; nor need the dwarf shrubs be removed until something is ready to put in their places. Verbenas, petunias, geraniums, and other tender plants required for propagation, should be potted up and got into houses, or frames, or pits; and all things should be done by the middle of the month, as if a frost were certain. The kitchen garden crops that are ready for storing should be taken in, and all fruit that is ready should be gathered.

THE TEMPERATURE AT WHICH PLANT-HOUSES
SHOULD BE KEPT DURING SEPTEMBER.

The Greenhouse.—From sixty to seventy degrees by day, and from forty-five to fifty degrees by night.

The Conservatory.—From sixty to seventy degrees by day, and from forty-five to fifty degrees by night.

The Plant-Stove.—From seventy-five to eighty degrees by day, and at night from sixty to sixty-five degrees.

The Orchid-House.—The warm or Indian house, eighty-five degrees by day, and seventy degrees at night. The cool or Mexican house, seventy-five degrees by day, and at night sixty degrees.

BRITISH WILD FLOWERS.

THE PARNASSIA.

Parnassia palustris, Linnæus (marsh Parnassia, or Grass of Parnassus).—Hypericaceæ § Elodeæ.

This plant is not a grass, although its trivial name might seem to lead to such a conclusion. It is, indeed, a small perennial herb, but sufficiently distinct in its appearance from a grass, as will be seen by the accompanying engraving. It derives its name from Mount Parnassus, to which locality, however, it is by no means peculiar.



A remarkable feature in this genus *Parnassia*, consists in the presence of a small, but easily detected scale, at the base of each of the five petals of the flower, these scales being placed opposite the petals, and forming a circular series within them. Formerly, these scales were called nectaries, it being common to give this designation to any appendicular series of organs interposed between the circle of petals and the circle of stamens; some botanists still maintain this view, while others, restricting the meaning of the term nectary, look upon these parts as mere appendages to the petals, and hence call them scales. These scales, as will presently be explained, are very singular and interesting objects, deserving close and attentive investigation.

One species only, the *Parnassia palustris*, is found wild in England, and concerning this

we must here transcribe a few lines from the pen of a well-known botanist, Mr. E. Lees, who writes:—"One of the prettiest floral sights that this month can offer to the eye of the botanical wanderer 'in wilds unknown to public view,' especially where the dripping fall of fountains beguiles the ear, is in the aspect of the fair *Parnassia palustris*, whose stainless argent flowers decorate particular plashy spots at this time. I shall not easily forget the sight of numbers of this most exquisitely beautiful of British flowers, growing amidst emerald moss, close to the very edge of the foaming waters of 'the seven springs' that pour their overflowing urns into the crystal Windrush, near Bourton-on-the-water, Gloucestershire: they inspired the following lines—

"By the brink of the fountain, sweet flow'r!
I saw thee for one happy hour;
In thy bridal array,
How beauteous, I say,
Was thy spotless display
Midst the streamlet's perpetual pour!

"I had never beheld thee before,
So fair on the rough barren moor.
Like a thought from above,
Like a vision of—love,
Among flowers—a dove,
Was thy aspect on Windrush's shore.

"As a beautiful vision, I think
Of thy blossoms on Windrush's brink;
In that wildly lone dell,
As if bound by a spell,
I shall oft seem to dwell,
Giving Memory a fair silver link."

The habit of the plant is to grow with a considerable tuft of leaves direct from the roots—radical leaves, as they are technically termed; these leaves are of a heart-shaped figure, and are stalked, and more or less profusely scattered over with small glands, which are best seen when the herbage is dried. From among these arises the erect twisted angular stem, which varies in height according to local influences; sometimes it has been found not more than one inch high, and sometimes it is one foot, but the more usual height is about eight inches; below the middle of the stem is a single stalkless leaf, whose base is clasped around it, and on the top is produced a solitary flower, the conspicuous part of which consists of five broadly ovate obtuse petals, which are concave, and spread out, forming a blossom about as large as, and nearly the shape of, the common "buttercup." These petals are of a pure white, striated with numerous pellucid veins: opposite to them, at their base, are the scales already alluded to; these are fleshy and heart-shaped, the margin fringed with from nine to thirteen awl-shaped filaments, each of which is tipped by a small globular yellow gland. The stamens alternate with the scales, and are about half as long

as the petals; they are remarkable for the peculiar property of bending forward one by one over the stigmas, so as to discharge their pollen upon them, and thus having fulfilled their mission, they recede and assume their former position; sometimes, but not often, two may be seen bending over at once; at first they are not longer than the germen, but each one, in order, becomes elongated as it sheds its pollen on the sessile spreading stigmas, which latter close as soon as all the anthers become emptied of their pollen; the ovules then increase in size, the capsule swells, the seeds become matured, and at length burst their fragile tenement to perform their office of perpetuating their kind. What stronger evidence of design in the works of creation can there be, than that afforded by the apparently trivial incident which has just been alluded to in the economy of this humble flower?

Such flowers are worth cultivating, and in this there is little difficulty. A damp, cool, shady border of peat soil is the most suitable place for them. The plant naturally grows in boggy meadows, and in similar moist peaty situations, especially in the northern parts of the kingdom. Hence a peaty soil and a damp situation are proper circumstances of its artificial cultivation. Growing in such situations, the plants may be easily taken up with a portion of soil adhering about their roots; and if this be done either in spring or autumn, when the plants are not too much exposed to drying influences, they suffer no inconvenience from the process of removal. In an artificial bog, a feature in pleasure-ground or wilderness scenery which may often not improperly be introduced in connexion with rock-work, the *Parnassia* would be quite at home, and would be very desirable for such a situation. The species, being a perennial herb, with numerous fibrous roots, may be readily increased by the process of division, which may be performed either in the autumn or spring.

A FEW REMARKS ON CHEMICAL MATTERS AND CROPS.

Simple Elementary Substances out of which Vegetables are principally formed.—1. Oxygen. 2. Hydrogen. 3. Nitrogen. 4. Chlorine. 5. Carbon. 6. Sulphur. 7. Phosphorus.

Compound Bodies, from which Plants procure the volatilizable or combustible part of their food.—1. Water. 2. Ammonia. 3. Carbonic acid. 4. Urea. The first is composed of 8 parts oxygen and 1 part hydrogen; the second, 14 parts nitrogen and 3 parts hydrogen; the third, 16 parts oxygen and

6 parts carbon; the fourth, 8 parts oxygen, 2 parts hydrogen, 14 parts nitrogen, and 6 parts carbon.

Compound and fixed Constituents which enter into the structure of most Plants:—

Potash (vegetable alkali), 8 parts oxygen, 40 parts potassium, and 9 parts water.

Soda (mineral alkali), 8 parts oxygen, 24 parts sodium, and 9 parts water.

Lime (well-known earth), 8 parts oxygen, 20 parts calcium.

Magnesia (an earth), 8 parts oxygen, 12 parts magnesium.

Silica (pure flint), 8 parts oxygen, 8 parts silicium.

Alumina (clay), 8 parts oxygen, 10 parts aluminium.

Oxide of iron (rust), 8 parts oxygen, 28 parts iron.

Oxide of manganese, 8 parts oxygen, 28 parts manganese.

Sulphuric acid (oil of vitriol), 24 parts oxygen, 16 parts sulphur.

Phosphoric acid (bone acid), 16 parts oxygen, 12 parts phosphorus.

Substances containing both the volatilizable and fixed Constituents of which Plants are formed, according to Haywood's calculation:—

Chloride of sodium (common salt), 36 parts chlorine, 24 parts sodium.

Sulphate of lime (gypsum), 40 parts sulphuric acid, 28 parts lime, 18 parts water.

Sulphate of soda (Glauber's salt), 40 parts sulphuric acid, 32 parts soda, 90 parts water.

Sulphate of ammonia (gas salt), 40 parts sulphuric acid, 17 parts ammonia, 9 parts water.

Nitrate of potash (saltpetre), 14 parts nitrogen, 40 parts oxygen, 48 parts potash.

Nitrate of soda (cubic petre), 14 parts nitrogen, 40 parts oxygen, 32 parts soda.

Phosphate of lime (bone earth), 28 parts phosphoric acid, 28 parts lime.

Quantity of Nitrogen (said to be the grain-perfecting and flesh-forming agent) contained in the following substances; that is to say, in one ton of each:—

	lbs.	oz.
Farm-yard dung	11	0
Night soil	39	8
Fresh bones	120	0
Rape dust	70	0
Dry blood	366	0
Guano	182	8
Shoddy	270	0
Sulphate of ammonia	470	0
Soot	41	6
Nitrate of potash	299	0
Nitrate of soda	364	0
In 100 gallons of urine . . .	15	8
In 100 gallons of gas liquor .	18	0

In an acre of the following crops there is contained, according to M. Boussingault's analysis, the annexed quantities of Nitrogen:—

	lbs.	oz.
Wheat (grain and straw) . . .	88	4
Oats ditto	65	5
Barley ditto	56	5
Rye ditto	59	10
Beans (grain)	122	2
Peas ditto	90	10
Potatoes (roots or tubers) . .	342	14
White turnip (roots)	85	0
Beet ditto	900	0
Red clover (cut green) . . .	320	0
Lucerne ditto	60	0

The remark appended to the quantity of nitrogen contained in the beetroot is, "*This enormous quantity of nitrogen must be partly extracted from the atmosphere, not wholly from manure;*" and if those who are so fond of theories were to apply the remark to many other points in connexion with their favourite crotchets, it would be some little check upon the enormous jumps they make at certain untenable conclusions, the reading public would be benefited, and the rash speculators, who try everything they read about, would be saved large sacrifices of time and money. The analyzers of soils and crops, who enlighten the world with their composition and quantities in such elaborate detail, may be quite right, but their conclusions are often wrong; and the little note above quoted illustrates a fact that we have often promulgated, namely, that chemists and theorists do not give the atmosphere credit for a tithe of its supplies. It is quite certain that the largest crops of beetroot have been produced on land that, for many years, received no other than farm-yard manure. If the favourite dogma of the theorists, "that the land must be supplied with what the plant takes away," were attended to in this case, it would require above eighty tons of farm-yard dung to the acre to supply only the nitrogen for the crop of beetroot. Well may it be said that the "nitrogen must be partly extracted from the atmosphere." It would be madness to deny that agricultural chemistry has done immense service to the farming community; but it is quite as certain that had there been a little more care exercised by those who hastily drew conclusions, much more good would have arisen from the knowledge imparted by agricultural chemists. Every year, however, removes some of the early errors, and experiments made on a large scale by a class of wealthy agriculturists who can afford it, add every season to the "KNOWLEDGE" which, to the agricultural as well as the political and social world, "IS POWER."

We are just now running our eyes over some very useful memoranda, and picking out a bit here and there,—some for information, some to exemplify our opinions.

SUSTAINING POWER OF FOOD FOR CATTLE.

The following quantities are equal in nutritive qualities for cattle; that is to say, one is as nutritive as the other all through:—

33 lbs. oil cake.	125 lbs. pea straw.
40 lbs. beans.	200 lbs new potatoes.
40 lbs. peas.	250 lbs. cabbage.
40 lbs. wheat.	275 lbs. carrots.
40 lbs. vetch hay.	300 lbs. barley straw.
55 lbs. Indian corn.	300 lbs. oat straw.
55 lbs. barley.	400 lbs. old potatoes.
57½ lbs. oats.	450 lbs. wheat straw.
90 lbs. good clover hay.	474 lbs. green clover.
100 lbs. good meadow hay.	500 lbs. turnips.

With respect to the theory of supplying the earth with the food for the next crop, we are told by Professor Playfair, in one of his lectures, "The best manure for plants is always found to be that of the animals which feed upon them; for," he says, "the excrements of animals must contain many of the inorganic constituents of the food they eat, and therefore must be best adapted for the growth of the same food." But, we are informed, the wheat-crop fully matured will take from the ground per acre, potash 6 lbs., soda 6½ lbs., lime 12½ lbs., magnesia 3½ lbs., silica 136½ lbs.; alumina, oxide of iron, and manganese, a very little; sulphuric acid 2½ lbs., phosphoric acid 8½ lbs., and chlorine 1½ lbs. It is a very pretty theory to replace all these ingredients when the wheat comes off; but this is not exactly the point recommended. The author of the Manual of Field Gardening says, "Articles that furnish these ingredients are previous applications of *lime*; things containing *potash* promoting, as they do, the solubility of the silica of the soil, which, in grain crops, appears to be the leading ingredient; top-dressings of *salts of ammonia* and things that contain *nitrogen*; (it does not appear from the analysis that *nitrogen* is withdrawn by the wheat-crop, though we are taught elsewhere that it is "*the grain-perfecting agent*"), *rape-dust*; *salts of soda*; also domestic guano, native guano, &c. have been found of great advantage in certain cases, the two latter contributing a good supply of phosphoric acid to the grain." What we remark is, that not one word is said about the *nitrogen* that the wheat takes from the soil; and yet an acre of wheat, according to the table we have already given, contains of nitrogen 88 lbs. 4 oz. There is the same kind of vagueness in every analysis; indeed, scarcely two chemists give in the same

results, or even resolve the subject into the same elements; in short, not two agree as to the composition of crops or manures. We are informed that "farm-yard dung yields per ton, *potash* 2 lbs. 4 oz., *soda* 1 lb. 10 oz., *phosphoric acid* 5 lbs. 1 oz., *sulphuric acid* 1 lb. 4 oz., *chlorine* 1 lb. 9 oz." The same authority, in another place, tells us, 10 to 15 tons of farm-yard manure is a proper dressing for mangold wurzel; and we take the latter quantity to be an excellent proportion for it, because we have seen very heavy crops from that dressing. This, then, supplies according to the foregoing analysis, *potash* 33½ lbs., *soda* 24 lbs. 6 oz., *phosphoric acid* 75 lbs. 15 oz., *sulphuric acid* 18½ lbs., *chlorine* 23 lbs. 7 oz. This we get at by multiplying the contents of 1 ton by 15, the number of tons known to be a capital dressing; yet we are gravely informed that an acre of this crop withdraws from the soil, *potash* 493 lbs., *soda* 1,059 lbs., *lime* 95 lbs., *magnesia* 46 lbs., *silica* 35 lbs., *alumina* 7 lbs., *oxide of iron* 19 lbs., *oxide of manganese* 17 lbs., *phosphoric acid* 56 lbs., *sulphuric acid* 41 lbs., *chlorine* 127 lbs.; so that the dung does not supply much more than a fourteenth part of the *potash* required, nor of *soda* more than a forty-second part; *sulphuric acid* not half enough; *chlorine* not a fifth part; to say nothing of other ingredients, and 900 lbs. of *nitrogen*, mentioned in a table already quoted, being contained in an acre of beet. We could adduce fifty instances of agricultural chemists, and writers quoting from them, differing widely upon the facts, and making sad blunders in the application of them; but all we want to impress upon the minds of experimentalists is the necessity of using their own common sense before they adopt any expensive measures of (so-called) economy, based on untried theories. There are plenty of wealthy landholders and noble farmers to try all the experiments; and it is far better to let those who can apply costly means, and afford a failure, be the forerunners in all alleged agricultural improvements. We should like to see all the great men who speak and write upon agricultural chemistry, produce the analyses of different professors a little more alike than we have yet seen them. We should like them to be produced on the same plan; that is, reduced to the same substances. If the constituent parts of dung are to be *potash*, *soda*, *phosphoric acid*, *sulphuric acid*, and *chlorine*, let all other manures be reduced to whatever they may contain of the same things, and add whatever else they may contain also; but let us have no compounds of one kind by one chemist, and compounds of another kind by another chemist. However, we must make one remark on the analysis of farm-yard manure. Nothing can be so unsatisfactory,

or of so little use to anybody, because farm-yard dung differs in strength more than anything we know, according to its condition; and forty different heaps, in as many different yards, would be almost certain to give forty different results.

HINTS TO SEED BUYERS.

For the benefit of our readers who know old things, by their old names, we would just inform them that the seed-shops have a different language in which to do business to that which they had in our younger days. For instance—

Monkshood is called . . .	Aconitum.
Rose Campion . . .	Agrostemma.
Pimpernel . . .	Anagallis.
Snap Dragon . . .	Antirrhinum.
Columbine . . .	Aquilegia.
Prickly Poppy . . .	Argemone.
Swallow Wort . . .	Asclepias.
Hawkweed . . .	Borckhausia.
Cape Marigold . . .	Calendula.
Marigold . . .	Tagetes.
Indian Shot . . .	Canna indica.
Cockscomb . . .	Celosia.
Wallflower . . .	Cheiranthus.
Jacobæa . . .	Senecio.
Catchfly . . .	Silene.
Egg Plant . . .	Solanum.
Feather Grass . . .	Stipa.
Nasturtium . . .	Tropæolum majus.
Thorn Apple . . .	Datura.
Gourd . . .	Cucurbita.
Broom . . .	Cytisus.
Larkspur . . .	Delphinium.
Pink . . .	Dianthus.
Foxglove . . .	Digitalis.
Everlasting Sunflower . . .	Elichrysium.
Hedge Mustard . . .	Erysimum.
Horn Poppy . . .	Glaucium.
Globe Amaranthus . . .	Gomphrena.
Cotton . . .	Gossypium.
Sunflower . . .	Helianthus.
Candy Tuft . . .	Iberis.
Touch-me-not . . .	Impatiens.
Sweet Pea . . .	Lathyrus odoratus.
Virginia Stock . . .	Malcomia.
Stocks (Ten-week). . .	Mathiola annua.
Marvel of Peru . . .	Mirabilia.
Tobacco . . .	Nicotiana.
Poppy . . .	Papaver.
Winter Cherry . . .	Physalis.
Persicaria . . .	Polygonum.
Purslane . . .	Portulaca.
Cinquefoil . . .	Potentilla.
Venus's Looking-glass . . .	Prismatocarpus.
Mignonette . . .	Reseda.
Palma Christi . . .	Ricinus.
Stone Crop . . .	Sedum.

Now these things having, with a few more, been familiar as household words to everybody who had a rod of ground to sow once a-year, it is quite necessary our unlearned readers should be made acquainted with the names by which the same things are now represented on the packets sold at the shops. We may buy twenty-four kinds of seeds, comprising all the most popular, and yet miss the mignonette, sweet peas, stocks, candy tuft, cockscomb, egg plant, and not dream that we have them in *Reseda*, *Lathyrus*, *Mathiola*, *Iberis*, *Celosia*, and *Solanum*. The great effort to bring everything under its botanical name may induce some to buy old things with new names, thinking they have really new things; but it is not the way to advance the interests of the trade. It is a kind of affectation not popular. Thousands even now only know these flowers by their old names, and consequently feel altogether puzzled when they receive papers of seed that they never heard of. We grant that "a rose by any other name would smell as sweet," but under another name people would not seek to smell it. On this account, we earnestly entreat all seedsmen to follow the example of the Horticultural Society in this particular, and have the English and well-understood name, as well as the botanical jargon, printed or very legibly written on the paper. We have seen persons of the middle class, well educated in English, and moving in good society, but who never dreamed that *Aquilegia* was columbine, that *Cheiranthus* was the wallflower, or that *Tropæolum majus* was the common nasturtium. To botanical people this may seem all very strange; and to thousands of liberal jog-trotting solid tradesmen the botanical names appear quite as strange; so that they should never appear without the English ones annexed. Indeed, the English ones ought to stand first.

BOX EDGINGS.

NOTWITHSTANDING many writers object to box edgings, it is impossible to deny that they are superior in appearance to all others composed of plants, and only give place to that which is not yet much known, edges of green glass. We will concede at once the fact that a gentleman may order a box edging, and have a very ugly affair; we will not deny that we have seen them so badly formed and planted that we should be inclined to condemn them, were it not that we know how they ought to be done, and can do them; but, strange as it may appear, the new race of gardeners, highly recommended by public bodies, seem totally incapable of doing as it ought to be done, any of those groundworks which we have

always considered the very foundation qualities of a good gardener. We have even seen writings in which the very directions for forming box edgings were altogether wrong ; so wrong that we could defy the writers to carry out their own directions and have a good piece of workmanship, for such it is. The requisites for a good box edging are, first, that the box shall be all the same height and width ; second, that the surface of the soil, and, consequently, the surface of the box above it, shall be all perfectly level ; thirdly, that the gravel outside and the soil inside shall be even, not one higher than the other ; lastly, that the figure, whatever it may be, shall in all respects be accurate. If a straight line, there shall not be a perceptible bend in it ; if circular, it shall be an easy, uninterrupted sweep, mathematically correct, at least so much so that the eye shall not detect any deviation. The trial of skill is in the formation of a geometrical garden, and not one gardener in twenty can do this properly ; but, as we shall not go into the formation of these gardens at present, we will confine our remarks to a straight line, the simplest of all the forms, because a line properly stretched makes it.

The preparation for box edging is digging, breaking all the lumps, and levelling ; the ground on both sides of the proposed line must be trodden down firm, or heavily rolled, so that the surface may be right as to the level it is to be left, and the soil of a like hardness, to hold its form when cut. Now stretch the line quite tight and close to the surface ; with your spade sloping a little away from you, you have to cut down the soil so that the corner of it that you leave shall be close to the tight line, not leaving the eighth of an inch on the outside of the line, nor cutting any underneath it. Many people chalk the line, and make a mark, and cut the soil to the chalk ; but, for anything straight, the line is simple enough, and soon done : this, cut with the spade, slopes towards the path, of course, and to retain the bank which you form you pull the earth which you shave off towards the centre of the path ; the bank, therefore, ought to exhibit a smooth sloping side, four or five inches deep, with the loose mould in front of it ; the top ought to be the flat part of the bed which is to be edged. The preparation of the box is another part of the work requiring some nicety : the edging can hardly be too narrow, so that the box requires to be torn to pieces, such pieces having roots to them and hearts to them, and the tops should be cut square ; all the plants ought to be the same size as to thickness, though some may spread out wider than others. The roots, which are in general of all manner of lengths,

have also to be trimmed up, so that they can be easily placed. Now you may begin placing the plants side by side, perfectly close ; put one inch above the top surface, and no more, and as each plant is placed with one hand, draw the loose earth up against it with the other, pressing it so as to hold it there. If this is done properly, the box is all held in its place by being banked up, and shows a level top. When the gravel comes to be put in the path, it is filled in exactly level with the soil the other side of the box, so that the box is an inch high. If here and there a bit stands up a trifle higher, take it off with the edging shears, that it may be as even as a die. In forming any other figures, the levelling, pressing, and smoothing, must be the same, but the figure has to be scratched out upon the soil ; circles, or portions of circles, have only to be made by a point of anything having a loop of line over it, and the line is put over a stake fixed somewhere so as to make the line come where you wish it ; but once having marked the place, you form your bank just in the same way, and your box cannot form a wrong figure, because the bank in slope ought to be too firm to give way easily, and the pressure of the box against a firm place of a right figure must force it into the proper form. These box edgings are exceedingly neat directly they are finished, but they thicken the very first season of growth, and grow a little uneven at top ; but this unevenness may be regulated as often as you please with the scissors or shears, for box sustains no harm from clipping at any time of the year. Box, to be neat, must be always kept well down ; if it gets too high it conceals the beauty of the border ; however thick it may be allowed to get, it must not get high. Box takes most harm from the sweeping of gravel walks ; the leaves are rubbed off by the broom, the box gets naked at the bottom, and very soon exhibits gaps which destroy all its beauty, and get for it a bad name ; but the broom has no business near the box, which should be green to the bottom, and never show a stem ; nor is it the nature of box to do so, unless damaged, as we have already described, by the sweeping of the paths. Some persons kill the weeds in the gravel walk with salt ; this will in time be washed to the roots of the box, and kill that also : others water gravel walks with salt and water to kill worms ; this is also fatal, and the fruits are large patches of dead box, increasing in quantity almost every time you look at it. Were it not for the damage done to box-edgings, they would be the most compact and elegant of all subjects to mark out the edges of beds and borders. But there are cases in which box would be out of place : the edges of borders next the carriage road should be grass

a foot wide, for it is the only proper match for lawn; and wherever there are clumps or borders connected with lawns, there ought to be the same uniform width of grass next the road. Box is only fit for the edges of beds in a flower garden; geometrical gardens should have box edges, and that there may be uniformity, there ought to be only one width of path, so that the box edging may always be the same distance from its neighbour on the opposite side of the path. Geometrical gar-

dens require from eighteen inches to two feet of path, and however this path may be designed, it ought in no place or part to be wider or narrower. It requires some ingenuity to preserve this uniform width, but it must be done to make the design perfect. In these matters there is no substitute for box, unless it were glass edgings, so contrived as to be laid down in small bits, that any figure required might be formed without corners or awkward bends.

THE EXTENT OF THE DISEASE IN THE POTATO EXAMINED.

It would seem to form the whole business of life with some journalists, to rake up all the information that can tend to excite alarm, and to treat such evidence as if it were of more than its real importance. Hence, we find in the columns of a newspaper extracts from twenty or thirty letters, announcing the appearance of the disease in the potato crop; and the journalist absolutely seems to revel in the intelligence. We can almost imagine that we see him rolling about among the letters like a cat in a mint bed, as if he could not have enough of them. We do not object to a man having his hobby,—we only wish to caution the public against any supposition that it is of consequence. One journalist seems to luxuriate in all the accounts of the cholera, and ransacks every continental and oriental newspaper for “cases and rumours of cases.” Another gloats on murders in Ireland and signs of rebellion, and scrapes together every morsel of such news that can be got from the Hibernian columns. A third, like Dr. Smee’s *aphis vastator*, and the fungus which distinguishes the affected plants, seems to have actually lived upon the potato disease; but let us, after admitting that there is and was and always will be a disease among potatoes, as well as the fly among the turnips, and the smut on wheat, see how much the alarming news is worth, according to the frightful accounts in the journal in question.

Say, the journal has seven thousand subscribers, and being a paper written especially for a class which grows potatoes, no better authority could be had for the extent of the disease. Some of these papers are read by a score people, and if we allow each to be only seen by three, we may calculate at least on twenty thousand readers.

The eager anxiety to publish news of the potato disease, has induced as eager an anxiety to communicate it; and therefore we need scarcely any better evidence of the extent than the news of it raked up from these twenty thousand witnesses. Well, put it at the most, fifty of these have discovered the disease—just a four-hundredth part. We will suppose that

none of these fifty are alarmists, and therefore that they have not exaggerated matters, and that they are all average growers; that is, that they grow upon the average as many as others. Well, if none of them saved a single potato, one four-hundredth part of the potato crop is condemned, but not one-half will be affected, not even according to their own accounts, and if so, only an eight-hundredth part of the crop is lost. We only mention this to show the public the extreme folly of attributing any weight to these collectors of the doleful.

Before we had any scientific alarmists, to put a mysterious face upon these casual visitations, which almost alone check the ambition of man and teach him his nothingness, we had the rust and the smut and the fly and mildew and sundry other fatal enemies to our crops, and regarded them as serious losses; but now that scientific men want to show off their knowledge by discussions and theories and dogmas, to account for visitations of that nature, we are pestered with the most hideous accounts of the disorders first, that we may afterwards hear the causes explained. The potato was doomed as a vegetable; scientific men strongly recommended its abandonment for something else. Two abundant potato harvests have falsified their predictions; a third, as far as it has gone, has been not only bountiful but of matchless quality on the whole; and, thanks to the contempt which common-sense people have for science, there is so large a quantity planted in spite of advice to the contrary, that if one-half the late potatoes fail and are lost, there will be abundance still. Recollect, that if all the bits of intelligence be scraped together from all the papers, and it should appear that a thousand growers are suffering, it would only be a ten-hundredth part of the million that is growing them. And there is no fear but that everybody who can find a plant mildewed, will forthwith furnish some hungry disease-patronizer with his full, true, and particular account. We only hope and trust that it may not spread so fatally in

Ireland as it did in 1846; but thousands of tons of fine potatoes were harvested without a word being said about them, though every failure was carefully recorded, to influence the markets by the general alarm created, until the holders knew not how to ask enough, and overstored their market, saddled at last with thousands of tons that were consigned to the pigs and cattle.

There is to our mind a wickedness in all endeavours to alarm the public: gross exaggeration is catching; nothing so true as the old saying, "a story never loses by carrying." It is the crying evil of all journalists, that they overdo everything; but it is the fault of the public that they believe one-half that is written. We are inclined to admit the potato disease is worse than it really is; we will say it may increase, and be five times as bad as the alarmists say it is, and even then there will be no scarcity. It falls severely on individuals whose crops are affected, just as mildew upon wheat, or a flood that sweeps away a crop of mown hay; but the markets of the world have no sympathy for individual loss. If the newspapers in general lend themselves to the alarmists, and copy from the class papers, they may frighten the public into buying and raise the price; but the public will be foolish indeed, if with bread at sixpence a loaf they buy a single pound of potatoes at an advanced price. A family may live on bread as well as potatoes for their vegetable diet, and green vegetables are cheap enough in all conscience; it would be next to madness to pay a shilling a hundred-weight more for potatoes than their proportionate value. Leave those who hold up for price with their potatoes on their hands; they will soon cease to rely on the alarmists for an advance.

WHY GARDENING PRODUCES PLEASURE.

How many thousand persons who have retired from the turmoil of business, derive their principal comfort and recreation from their garden? How many owe the enjoyment of good health, under Providence, to the air and exercise they take in their various garden operations? How many thousand mechanics, who are many hours a-day breathing the pestilential atmosphere of manufactories, fly to their little gardens, and find rest in the "change of work," that in their case is indeed "a holiday?" We might go on asking questions of this nature to fill a volume, and all the answers would favour gardening. Every one admits that gardening has charms which scarcely any other recreation possesses; but this is easily explained. It gratifies more senses than any thing else. Music charms the ear, but the garden furnishes gratification

to the eyes, nose, and mouth—the most delicious fruits; the most sweet and aromatic perfumes; the most beautiful flowers. Here the garden outstrips all ordinary sources of delight, and the seasons constantly change the aspect. As one thing declines, another takes its place: one series of luscious fruits, brilliant flowers, and sweet perfumes gives place to another, so that neither of them palls the appetite. But there is another charm in the garden: you may enjoy in it solitude or company;—you may study nature in perfection. There are a thousand degrees of excellence to be found in gardens, from the neat well-kept garden of the cottager, who has his fruit and flowers in abundance and variety, to the gorgeous establishments of the wealthiest of the country, which are like fairy land: there may not be two alike, but all are attractive, all possess the means of pleasing whoever sets foot within them. But, if such pleasure may be derived from merely visiting a garden, how much more satisfaction do we derive, when we see in each beauty the result of our own labour, or our own direction! Who is there that does not, more or less, exult in the production of his own garden? And be it known, that the denizens of great towns know not the luxuries to be found among vegetables fresh from the garden. It is only those who have tasted fresh picked beans and peas, cabbages newly cut, carrots and turnips just pulled, that can tell of the superiority over those that have been sweating in large bulk for many hours on their way from the garden to the market, and withering in the sun after their arrival: there is no comparison. In this enjoyment the humble cottager, with his few rods of ground, surpasses even the wealthy who are obliged to live in towns and trust to markets. He who is his own gardener, and only now and then employs a gardener, finds healthful exercise from the moment he rises till his breakfast time; or, if he feels so inclined, he may simply take the air without the labour; but even the labour is sweetened by the result of it. No class feel this so much as the cottager, who works or attends all day at his service, and goes to his garden in the cool of the evening, making it yield him a gratifying change of labour, and a profitable addition to his food. Thousands who would find it difficult to live on their scanty earnings without a garden, enjoy actual luxuries as the compensation for their labour in one; and it is a sorry circumstance, that millions pent up in towns have not a bit of ground to cultivate, and therefore suffer the privation of many comforts which the garden would produce them. But this is not all; how are the mechanics to spend their evenings? They must go some-

where. Home, with half-a-dozen squalling children about them, is not the place they would seek; society they want, and they look for it at the beer-shop, or the public-house. The greater portion of such men remain poor and penniless all their lives; they have never a shilling before hand, because they waste money when they do not earn it; and as they spend all they can get, they have no incentive to creditable exertion. They never look to the means of buying clothes either for themselves or children, until the last moment; they are, consequently, always poorly clad, be their earnings what they may. We do not mean to say that if all these men were suddenly provided with a garden they would be as suddenly economical and industrious, but that had they possessed one, not one in ten would have been so lost; and were they removed from all their

old associates, many of them would find that comfort in their garden, and that satisfaction when they went to rest, which they never experienced after the most agreeable of their evenings in a public-house. Let all those, then, who can appreciate a garden, look upon it as the regeneration of the thoughtless, the antidote to the beer-house, the greatest of all inducements to industry and economy, and with this impression promote to the fullest extent of their power the providing of gardens for the industrious classes. Much as this has been done in some localities, it is not yet appreciated as it should be; thousands of acres might be allotted with advantage. If it be objected that there is no land in towns, there is plenty outside of towns; and if men can walk, as many do, some miles to work, they can walk a mile or two for pleasure.

THE HELIANTHEMUM, OR SUN ROSE.

THIS belongs to a large family of small plants, distinguished chiefly for the greatest of all the defects that detract from the value of garden plants,—the extreme flimsiness of the petals, and the consequent rapid decay of the flowers. This fault is in part compensated for by the abundance of bloom; but there is nothing in the best of them that places it before the common field poppy. However, as a tribe of plants which some honour by giving a place in collections, and others make appear important by devoting a large space in their catalogues, we shall notice them at some length. They require a dry situation, and therefore flourish best on high dry banks, or rock-work. They want shelter, and suffer from moisture. Let the necessary conditions, then, be complied with, and they will not fail. Like all large families, it is very difficult to distinguish between some of the members: they are far too much alike to be distinguished by ordinary observers. However, as they comprise annuals, evergreens, and various colours, we here enumerate the principal species and varieties known among botanists.

DESCRIPTIVE LIST OF HELIANTHEMUMS.

Helianthemum acuminatum, Persoon (acuminate Sun Rose).—A small evergreen undershrub, growing a foot high, with erect branches, long-stalked, hairy, oblong leaves, with revolute margins and loose racemes of yellow leaves. Native of Nice. Introduced in 1820. Flowers in June and July. It is the *Cistus serpyllifolius* (Balbis).

Helianthemum ægyptiacum, Miller (Egyptian Sun Rose).—A hardy annual, with erect downy stems, six or eight inches high; linear oblong leaves, greyish beneath, with revolute margins; small yellow flowers. Native of

Egypt, Barbary, and Spain. Introduced in 1764. Flowers in June and July. It is the *Cistus ægyptiacus* (Linnæus).

Helianthemum algarvense, Dunal (Algarve Sun Rose).—A branching evergreen undershrub, growing three feet high, with stalkless ovate-lanceolate leaves, somewhat hairy, and deep yellow flowers, with a dark spot at the base of each petal. Rather tender. Native of Portugal, in the Algarves. Introduced in 1800. Flowers from June to August. Called also *Cistus algarvensis* (Sims).

Helianthemum alpestre, Dunal (Alpine Sun Rose).—A small procumbent evergreen suffruticose plant, with hairy branches, oblong-elliptic, somewhat glabrous leaves, and elegant yellow flowers. Native of Germany, Switzerland, France, and Italy, on rocks. Introduced in 1818. Flowers in July and August. It is the *Cistus alpestris* (Crantz), and *C. celandicus* (Jacquin).

Helianthemum alyssoides, Ventenat (alysum-like Sun Rose).—An erect much-branched evergreen undershrub, growing three feet high, with hoary branches, hairy oblong-ovate leaves and yellow flowers. Rather tender. Native of France and Spain. Uncertain when introduced. Flowers from June to August. Called *Cistus alyssoides* (Lamarck).

Helianthemum Andersoni, Sweet (Anderson's Sun Rose).—A small procumbent evergreen suffruticose plant, with ascending hoary branches, oblong-lanceolate greyish leaves, and variable coloured flowers, some being bright yellow, others pale straw colour, on the same branch. A hybrid raised in the Chelsea Botanic Garden in 1823. Flowers from May to October. It is a free grower, and seeds freely.

Helianthemum arabicum, Persoon (Arabian

Sun Rose).—A small twiggy trailing plant, growing nearly a foot high, with hairy ascendent stems, alternate linear-oblong hairy leaves, and yellow flowers. Native of Arabia, Spain, and Italy. Introduced before 1826. Flowers in June and July. It is also known as *Cistus arabicus* (Linnæus), *C. ferrugineus* (Lamarck), *C. Savi* (Bertoloni), and *H. viscidulum* (Steven).

Helianthemum atriplicifolium, Willdenow (orache-leaved Sun Rose).—An erect evergreen undershrub, growing three or four feet high, with whitish branches, broad-ovate leprous downy leaves and large yellow flowers. Native of Spain. Introduced in 1656. Flowers in June and July. This is the *Cistus atriplicifolius* (Lamarck).

Helianthemum barbatum, Persoon (bearded racemed Sun Rose).—An evergreen undershrub, growing about a foot high, with numerous erect hairy branches, hairy leaves (lower ones roundish-ovate, upper ones elliptical), and long racemes of yellow flowers. Native of the south of Europe. Introduced in 1820. Flowers in June and July. It is the *Cistus barbatus* (Lamarck).

Helianthemum Barrelieri, Tenore (Barrelier's Sun Rose).—An erect evergreen undershrub, growing a foot high, with pubescent branches, linear-oblong pubescent leaves, revolute and ciliated at the margin, and racemes of yellow flowers. Native of Italy and Spain. Introduced in 1820. Flowers from June to August. Rather tender.

Helianthemum brasiliense, Persoon (Brazilian Sun Rose).—An undershrub scarcely growing a foot high, with hairy almost herbaceous branchlets, stalkless hairy ovate-oblong leaves, and bright yellow flowers. Rather tender. Native of the mountains of Brazil. Introduced in 1823. Flowers in June and July. Known as the *Cistus brasiliensis* (Lamarck), and *C. alternifolius* (Vahl).

Helianthemum canariense, Willdenow (Canary Island Sun Rose).—A small trailing undershrub, with downy hoary branches, ovate-elliptic downy leaves, hoary beneath, and erect racemes of yellow flowers. Rather tender. Native of the Canary Island. Introduced in 1790. Flowers in June and July. This is the *Cistus canariensis* (Jacquin), and *H. canescens* (Mœnch).

Helianthemum canadense, Michaux (Canadian Sun Rose).—An erect herbaceous perennial, growing about a foot high, with hairy branches, oblong-lanceolate hairy leaves and yellow flowers. Native of Canada and Carolina. Introduced in 1799. Flowers in July and August. It is the *Cistus canadensis* (Willdenow).

Helianthemum candidum, Sweet (white-leaved Sun Rose).—An erect much-branched

evergreen undershrub, growing about three feet high, with whitened branches, obovate-lanceolate leaves, tapering to the base, and white on both sides, and bright yellow flowers marked with a dark velvety spot at the base of the petals. Native of Spain. Introduced before 1826. Flowers from June to August. Rather tender.

Helianthemum canescens, Sweet (hoary-leaved Sun Rose).—A diffuse-growing procumbent sub-evergreen suffruticose plant, with ascending hoary branches, flat ovate-oblong leaves (upper ones lanceolate), hoary beneath, and beautiful large reddish-crimson flowers, the petals having each a small orange-coloured spot at their base. Origin unknown. Cultivated before 1826. Flowers from June to August. One of the handsomest of the genus.

Helianthemum canum, Dunal (hoary Sun Rose).—A small procumbent evergreen suffruticose plant, with hoary ascendent stems, obovate or elliptic hairy and hoary leaves, and racemes of small yellow flowers. Native of England and of the south of France and Germany. Flowers in June and July. It is the *Cistus canus* (Jacquin), and the *C. anglicus* (Linnæus).

Helianthemum carolinianum, Michaux (Carolinian Sun Rose).—An erect herbaceous perennial, growing nearly a foot high, with hairy obovate leaves, and large yellow flowers. Native of North America. Introduced in 1823. Flowers in July and August.

Helianthemum cheiranthoides, Persoon (wall-flower-like Sun Rose).—An erect branched evergreen undershrub of three feet high, with hoary branches, oblong-lanceolate hoary leaves, tapering to the footstalk, and handsome yellow flowers. Rather tender. Native of Spain. Introduced in 1800. Flowers in July and August. Called also *Cistus cheiranthoides* (Lamarck), and *C. elongatus* (Vahl).

Helianthemum cinereum, Persoon (grey-leaved Sun Rose).—A small branching evergreen suffruticose plant, growing a foot high, with hoary branches, ovate downy and hoary leaves, and racemes of small yellow flowers. Rather tender. Native of Spain. Date of introduction not known. Flowers in June and July. It is the *Cistus cinereus* (Cavanilles).

Helianthemum confertum, Dunal (crowded-flowered Sun Rose).—A small evergreen undershrub, with branching downy stems a foot high, lanceolate-elliptical downy leaves, hoary beneath, and crowded yellow flowers. Rather tender. Native of Teneriffe. Not known when introduced. Flowers in June and July.

Helianthemum confusum, Sweet (confused Sun Rose).—A small procumbent evergreen suffruticose plant, with smoothish branches, oblong-ovate leaves, hoary beneath, and delicate white flowers marked with yellow at the base of

the petals. Native of France and Spain. Introduced in 1829. Flowers from May to July. This kind is sometimes confused with *H. polifolium*.

Helianthemum crassifolium, Persoon (thick-leaved Sun Rose).—A low evergreen suffruticose plant, growing about a foot high, with erect stems, the lower leaves ovate, upper ones linear-oblong, and short racemes of yellow flowers. Rather tender. Native of Barbary and Spain. Introduced in 1818. Flowers from May to July. It is also known as *Cistus glaucus* (Desfontaines), and *H. Sente* (Lagasca).

Helianthemum croceum, Persoon (saffron-coloured Sun Rose).—A low procumbent evergreen suffruticose plant, with spreading somewhat erect hoary branches, leaves with revolute margins, hoary beneath (the lower ones nearly round, middle ones elliptical, upper ones lanceolate), and large dark yellow flowers. Native of Spain and Barbary. Introduced in 1826. Flowers in June and July. A very ornamental species for rockwork, or the flower border. It is also known as *Cistus croceus* (Desfontaines). There are two or three slight varieties.

Helianthemum cupreum, Sweet (copper-coloured Sun Rose).—A small suffruticose plant, with procumbent branches, oblong lanceolate hoary leaves, hairy beneath, and dark copper-coloured flowers, with a darker mark at the base of the petals. A hybrid, raised before 1827. Flowers from May to August.

Helianthemum denticulatum, Thibaud de Chauvalon (tooth-leaved Sun Rose).—A hardy annual, with erect downy branches a foot high, obovate-oblong leaves, hoary beneath, and yellow flowers. Native of the south of France. Introduced in 1818. Flowers in June and July. Also called *Cistus salicifolius* (Gouan).

Helianthemum dichotomum, Dunal (dichotomous Sun Rose).—A small prostrate evergreen suffruticose plant, with smoothish dichotomous branches, minute ovate glabrous leaves, with revolute margins and slender racemes of very small deep yellow flowers. Rather tender. Native of Spain. Introduced in 1826. Flowers from June to August. Known also as *Cistus dichotomus* (Cavanilles).

Helianthemum diversifolium, Sweet (various-leaved Sun Rose).—A small procumbent evergreen suffruticose plant, with downy and somewhat erect branches, flat, oval, or oblong leaves (upper ones linear-lanceolate), hairy above and hoary beneath, and rich dark pink flowers, with a deep copper-coloured mark at the base of the petals. Native country unknown. Introduced in 1829. Flowers from May to July. There is a fine variety called *multiplex*, with large double deep purplish-red flowers.

Helianthemum ericoides, Dunal (heath-like Sun Rose).—A small sub-evergreen undershrub, growing a foot and a half high, with erect stems, short semi-cylindrical leaves, and yellow flowers. Rather tender. Native of Spain, and of Naples. Time of introduction unknown. Flowers from June to August. It is the *Cistus ericoides* (Cavanilles).

Helianthemum eriocaulon, Dunal (woolly-stemmed Sun Rose).—A hardy annual, with very hairy stems, from six inches to a foot high, oblong-linear hairy leaves, and simple racemes of yellow spotted flowers. Native of France and Spain. Introduced in 1817. Flowers in July and August. It is the *Cistus serratiflorus* (Lambert), and *H. semistipulatum* (Lagasca).

Helianthemum eriosepalon, Sweet (woolly sepalated Sun Rose).—A small procumbent evergreen suffruticose plant, with the branches somewhat hoary at the apex, lanceolate hairy leaves, with revolute margins, and racemes of sulphur coloured flowers, with a yellow mark at the base of the petals. A hybrid, raised before 1828. Flowers from June to August.

Helianthemum foetidum, Persoon (fetid Sun Rose).—A small evergreen suffruticose plant, with procumbent hairy branches, oblong hairy leaves, and white flowers. A hybrid, raised before 1800. Flowers from May to July. This is the *Cistus foetidus* (Jacquin).

Helianthemum formosum, Dunal (beautiful Sun Rose).—An erect evergreen undershrub, growing four feet high, with numerous hoary looking branches, obovate lanceolate leaves, and fine yellow flowers, with a dark spot at the base of each petal. Rather tender; does well planted out in spring. Native of Portugal. Introduced in 1780. Flowers from May to July. Known also as *Cistus formosus* (Sims). This bears seed freely.

Helianthemum Fumana, Miller (Fumana Sun Rose).—A much branched evergreen undershrub, growing a foot high, with the lower branches procumbent, alternate linear leaves, with hairy, rather involute margins, and yellow flowers with ovate petals. Native of various parts of Europe. Introduced before 1752. Flowers in June and July. It is often confused with *H. procumbens*. Also called *Cistus Fumana* (Linnæus). There are three varieties, *majus*, *minus*, and *virgatum*.

Helianthemum glaucum, Persoon (glaucous Sun Rose).—A small suffruticose glaucous evergreen plant, with ascending hoary branches, roundish leaves, (upper ones elliptic or lanceolate-oblong), and small pale yellow flowers. Native of Spain and Italy. Introduced in 1815. Flowers from June to August. A desirable species. It is the *Cistus glaucus* (Cavanilles).

Helianthemum globulariaefolium, Persoon

(globularia-leaved Sun Rose).—A herbaceous perennial, growing six inches high, with ascendent stems, obtuse somewhat spatulate leaves, and panicles of yellow flowers sometimes spotted at the base. Native of the north of Portugal. Introduced in 1826. Flowers in July. Also called *Cistus globulariaefolius* (Lamarck).

Helianthemum glomeratum, Lagasca (cluster-flowered Sun Rose).—An erect branching evergreen undershrub, about a foot high, with greyish branches, lanceolate oblong leaves, tapering to the base, and clusters of small flowers, often without petals. Rather tender. Native of Mexico. Introduced in 1823. Flowers in July and August. This is the *Cistus glomeratus* (Lagasca).

Helianthemum glutinosum, Persoon (clammy Sun Rose).—An evergreen undershrub, growing a foot high, with ascendent stems, greyish branches, linear clammy leaves, with revolute margins, and very small pale yellow flowers. Native of France and Spain. Introduced in 1790. Flowers from May to September, which is a recommendation; the flowers soon fall. Also known as *Cistus glutinosus* (Linnæus).

Helianthemum grandiflorum, De Candolle (large-flowered Sun Rose).—A small procumbent evergreen suffruticose plant, growing nearly a foot high, with hairy ascending branches, oblong flattish somewhat hairy leaves, and racemes of large pale yellow flowers. Native of the Pyrenees. Introduced in 1800. Flowers from June to August. It is the *Cistus grandiflorus* (Scopoli).

Helianthemum guttatum, Miller (spotted Sun Rose).—A hardy annual plant, growing six or eight inches high, with oblong linear hoary leaves, and loose racemes of pretty yellow flowers, with a dark spot at the base of the petals. Native of Anglesea and Jersey, and of France, Spain, Italy, and Turkey. Flowers in July and August. A very pretty little object, also known as *Cistus guttatus* (Linnæus). There are several recorded varieties:—*Columnæ* with entire spotted petals, (the *C. guttatus* of Smith); *Cavanillesii* with jagged spotted petals, (the *C. serratus* of Cavanilles); *Lamarckii*, with a small spot on the petals; and some others.

Helianthemum halimifolium, Willdenow (sea-purslane leaved Sun Rose).—An erect branched evergreen undershrub, growing three feet high, with whitened leaves and branches, ovate-oblong tapering leaves, and beautiful yellow flowers, in some varieties spotless, in others, with a small bloody spot at the base of each petal. Rather tender. Native of Spain and Portugal, by the sea side. Introduced in 1656. Flowers in July and August. Also called *Cistus halimifolius* (Linnæus).

Helianthemum hirtum, Persoon (hairy

Sun Rose).—A small procumbent evergreen suffruticose plant, growing about a foot high, with numerous ascendent hairy branches, ovate or oblong very hairy leaves, with revolute margins and hoary beneath, and large deep yellow flowers. Native of the south of France and Spain. Introduced in 1759. Flowers in June and July. It is the *Cistus hirtus* (Linnæus). There are some recorded varieties. *H. Lagasca* (Dunal), with linear leaves, the margins so much revolute as to make them appear almost terete, is probably a variety of this species, and is rather tender.

Helianthemum hispidum, Dunal (hispid Sun Rose).—A small evergreen suffruticose plant, with ascending hoary branches, oblong leaves with revolute margins, hoary beneath, and white flowers. Native of the south of France. Introduced in 1816. Flowers from May to July. This is the *Cistus hispidus* (Lamarck).

Helianthemum hyssopifolium, Tenore (hyssop-leaved Sun Rose).—A low procumbent sub-evergreen suffruticose plant, growing upwards of a foot high, with hairy branches, flat hairy oval leaves, (upper ones oblong-lanceolate). Native of Naples. Introduced before 1827. Flowers from May to August. There are three very distinct and handsome varieties: *crocatum*, with saffron-coloured flowers; *cupreum*, with reddish copper coloured flowers; and *multiplex*, with double, reddish copper coloured flowers; the habit of the last is more upright than that of the rest.

Helianthemum inconspicuum, Thibaud de Chauvalon (inconspicuous Sun Rose).—A hardy annual plant, with slender hairy stems, three or four inches high, oblong linear hairy leaves, and minute yellow flowers. Native of Spain. Introduced in 1819. Flowers in July and August.

Helianthemum intermedium, Thibaud de Chauvalon (intermediate Sun Rose).—A hardy annual, with erect slender greyish branches, six inches high, obovate oblong downy leaves somewhat toothed, and yellow flowers. Native of Spain. Introduced in 1759. Flowers in June and July. It is called also *Cistus salicifolius* (Cavanilles).

Helianthemum involucreatum, Persoon (involveruled flowered Sun Rose).—A branched erect evergreen undershrub, growing two feet high, with greyish branches, small ovate hoary leaves, and yellow flowers. Rather tender. Native of Spain and Portugal. Introduced in 1826. Flowers in June and July. Also called *Cistus involucreatus* (Lamarck).

Helianthemum italicum, Persoon (Italian Sun Rose).—A low glaucous looking procumbent evergreen suffruticose plant, with erect hairy branches, ovate hispid leaves (upper

ones lanceolate or oblong), and racemes of yellow flowers. Rather tender. Native of the Mediterranean, in dry hilly places. Introduced in 1799. Flowers from July to September. It is also called *Cistus italicus* (Linnæus), and *C. marifolius* (Bieberstein).

Helianthemum juniperinum, Lagasca (juniper-like Sun Rose).—A branching evergreen undershrub, growing a foot high, with ascendent stems, linear ciliated leaves somewhat revolute at the margins, and racemes of yellow flowers. Rather tender. Native of the south of Europe. Introduced in 1800. Flowers from June to August. Also called *Cistus lavipes* (Durand), and *C. mauritanicus* (Thibaud de Chauvalon).

Helianthemum kahiricum, Delille (Cairo Sun Rose).—A much branched evergreen undershrub, growing a foot high, with ascending branches, ovate hoary leaves with revolute margins, and one-sided racemes of yellow flowers. Rather tender. Native of Egypt. Introduced in 1820. Flowers in June and July. Called *Cistus stipulatus*, var. (Forskahl).

Helianthemum leve, Persoon (smooth Sun Rose).—An evergreen undershrub, growing a foot high, much branched, with erect branches, linear glabrous leaves with revolute margins, and yellow flowers. Rather tender. Native of Spain on hills. Introduced in 1826. Flowers in June and July. This is the *Cistus laevis* (Cavanilles).

Helianthemum lavipes, Willdenow (smooth-peduncled Sun Rose).—An evergreen undershrub, with ascendent stems, growing a foot and a half high, with setaceous smoothish leaves, and elegant one-sided racemes of yellow flowers. Rather tender. Native of the south of Provence, Spain, and Dalmatia, on rocks exposed to the sun. Introduced 1690. Flowers from June to August. It is the *Cistus lavipes* (Linnæus).

Helianthemum lanceolatum, Sweet (lanceolate-leaved Sun Rose).—A small procumbent evergreen suffruticose plant, with ascending smoothish branches, lanceolate leaves with revolute margins, hoary beneath, and large white flowers marked with yellow. A hybrid raised before 1818. Flowers from May to August.

Helianthemum lasianthum, Persoon (hairy-flowered Sun Rose).—An evergreen undershrub, much branched, growing three feet high, with greyish branches, ovate oblong greyish downy leaves, and yellow flowers, sometimes with a dark spot on the petals. Rather tender. Native of Spain. Introduced in 1826. Flowers in June and July. This is the *Cistus lasianthus* (Lamarck).

Helianthemum lavandulæfolium, De Candolle (lavender-leaved Sun Rose).—A small evergreen undershrub, growing about a foot

high, with erect hoary branches, oblong linear leaves with revolute margins, hoary beneath, and terminal racemes of yellow flowers. Native of France, Spain, Barbary, and Syria. Introduced in 1839. Flowers in June and July. This is the *Cistus lavandulæfolius* (Lamarck).

Helianthemum ledifolium, Willdenow (ledum-leaved Sun Rose).—A hardy annual plant, with downy stems, from six inches to a foot high, oblong elliptic somewhat toothed leaves, and pale yellow flowers. Native of England, and of the south of France and Spain. Flowers in June and July. The *Cistus ledifolius* (Linnæus).

Helianthemum leptophyllum, Dunal (slender-leaved Sun Rose).—A procumbent evergreen suffruticose plant, with ascendent greyish branches, narrow oblong linear leaves with revolute margins, whitish beneath, and long racemes of large deep yellow flowers. Native of Spain. Introduced in 1818. Flowers in June and July. It is also called *Cistus angustifolius* (Lagasca), and *C. stæchidifolius* (of gardens).

Helianthemum libanotis, Willdenow (rosemary-like Sun Rose).—An evergreen undershrub, growing about a foot high, with erect branches, linear leaves with revolute margins, and solitary yellowish-white flowers. Rather tender. Native of Portugal and Mauritania. Introduced in 1752. Flowers in June and July. Also called *Cistus Libanotis* (Linnæus), and *H. rosmarinifolium* (Lagasca).

Helianthemum lignosum, Sweet (woody Sun Rose).—An evergreen undershrub, growing about a foot high, the stems covered with scaly bark, the branches ascending and hairy, the leaves hairy, ovate, oblong, and hoary, the flowers yellow, growing in a panicle. Native of the south of Europe. Introduced 1809. Flowers in July and August. It is a curious and distinct species.

Helianthemum lineare, Persoon (linear-leaved Sun Rose).—A small evergreen suffruticose plant, growing a foot high, with elongated ascendent hoary branches, linear greenish hoary leaves with revolute margins, and loose racemes of white flowers. Rather tender. Native of Spain and the south of France. Introduced 1817. Flowers from June to August. Also called *Cistus linearis* (Cavanilles), and *C. pilosus* (De Candolle). Requires slight protection.

Helianthemum Lippii, Persoon (Lipp's Sun Rose).—A small evergreen undershrub, growing about a foot high, with pubescent whitish stems, elliptic-lanceolate (or linear-oblong) leaves, and short racemes of small crowded yellow flowers. Rather tender. Native of Egypt. Introduced in 1820. Flowers in June and July. Also known as *Cistus Lippii* (Linnæus).

Helianthemum lucidum, Hornemann (shining-leaved Sun Rose).—A small and procumbent evergreen suffruticose plant, with ovate glossy green leaves having revolute margins, and yellow flowers. Native country uncertain. Introduced in 1826. Flowers in May and June.

Helianthemum lunulatum, De Candolle (lunulate-marked Sun Rose).—A small sub-evergreen suffruticose plant, growing three or four inches high, with oblong ciliated leaves, and yellow flowers, the petals of which have each a copper coloured moon-shaped spot near their base. Native of the Alps of Piedmont. Introduced in 1826. Flowers in June and July. It is the *Cistus lunulatus* (Allioni).

Helianthemum macranthum, Sweet (large-flowered Sun Rose).—A procumbent evergreen suffruticose plant, with downy branches, flat ovate oblong leaves, smooth above and greyish downy beneath, and racemes of large cream coloured flowers, the base of the petals marked with yellow. A hybrid raised before 1829. Flowers from May to September. A variety called *multiplax*, having double flowers of the same colour, is very beautiful.

Helianthemum majoranæfolium, De Candolle (marjoram-leaved Sun Rose).—A small suffruticose plant, six inches high, with erect hairy branches, ovate oblong hairy leaves, hoary beneath, with revolute margins, and yellowish white flowers. Native of the south of Europe. Introduced in 1818. Flowers in May and June. This is the *Cistus majoranæfolius* (Gouan).

Helianthemum marifolium, De Candolle (marum-leaved Sun Rose).—A trailing evergreen suffruticose plant, growing nearly a foot high, with ovate-cordate or ovate leaves, hairy above and hoary beneath, and racemes of yellow flowers. Native of France, Spain, and Italy. Introduced in 1817. Flowers in June and July. It is the *Cistus marifolius* (Linnæus).

Helianthemum microphyllum, Sweet (small-leaved Sun Rose).—A much-branched erect evergreen shrub of about two feet in height, with hairy branches, obtuse downy leaves tapering to the base, and flowers of a bright yellow colour with a dark purple spot. Rather tender. Native of the west of France. Introduced in 1800. Flowers from June to August. It is by some regarded as a variety of *H. rugosum*, and by others of *H. alyssoides*.

Helianthemum Milleri, Sweet (Miller's Sun Rose).—A procumbent evergreen suffruticose plant, with hairy branches, flat oblong hairy leaves, and saffron-coloured flower with a dark mark at the base of each petal. A hybrid, raised before 1829. Flowers from May to July. A handsome plant, related to *H. hysopifolium*.

Helianthemum molle, Persoon (soft-leaved Sun Rose).—A small evergreen undershrub, growing a foot high, with hairy branches, roundish ovate hairy leaves, downy on both sides, and simple racemes of yellow flowers. Rather tender. Native of Spain. Introduced in 1817. Flowers from June to August. It is the *Cistus mollis* (Cavanilles).

Helianthemum mutabile, Persoon (changeable-coloured Sun Rose).—A small procumbent evergreen suffruticose plant, with downy branches, flat ovate oblong leaves, greyish and downy beneath, and handsome flowers. Native of Spain. Introduced before 1829. Flowers from June to August, and bears seed in fine seasons. This is the *Cistus mutabilis* (Jacquin). There are three varieties; one of which has white flowers, another has them rose-red, and another has them rose-coloured and double.

Helianthemum niloticum, Persoon (Nilotic Sun Rose).—A hardy annual, from six inches to a foot high, with erect downy branches, oblong elliptic hairy leaves, and yellow flowers. Native of Egypt, Barbary, Spain, and south of France. Introduced in 1817. Flowers from June to August. The *Cistus niloticus* Linnæus). There are three or four slight varieties.

Helianthemum nudicaule, Dunal (naked-stemmed Sun Rose).—A small procumbent evergreen suffruticose plant, with the branches hoary at top, oblong lanceolate leaves with revolute margins, hoary beneath, and racemes of yellow flowers. Native of the mountains of Spain. Introduced in 1826. Flowers in June and July.

Helianthemum nummularium, Miller (moneywort-leaved Sun Rose).—A small procumbent evergreen suffruticose plant, with hairy branches, orbicular leaves (upper ones oblong linear, hairy), and racemes of bright yellow flowers. Native of the south of France and Italy. Introduced before 1752. Flowers from June to August. *H. angustifolium* (Persoon) is probably not distinct from this.

Helianthemum obovatum, Dunal (obovate-leaved Sun Rose).—A procumbent evergreen suffruticose plant, with spreading greyish branches, obovate ciliated green leaves, and racemes of yellow flowers. Rather tender. Native of Spain. Introduced in 1826. Flowers in June and July. Also called *Cistus italicus* (Linnæus).

Helianthemum obscurum, Persoon (obscure Sun Rose).—A much-branched suffruticose evergreen plant, growing about a foot high, with ascending hairy branches, elliptical hairy leaves, and smallish pale-yellow flowers. Native of Europe. Introduced in 1816. Flowers from May to August.

Helianthemum ocymoides, Persoon (basil-

like Sun Rose).—An erect evergreen undershrub, growing three feet high, with hoary branches, ovate-oblong leaves, and yellow flowers, sometimes spotted, produced in a somewhat umbellate form. Rather tender. Native of Spain and Portugal. Date of introduction uncertain. Flowers from June to August. Called also, *Cistus ocymoides* (Lamarck), and *C. sampsucifolius* (Cavanilles).

Helianthemum oelandicum, De Candolle (Celand Sun Rose).—A procumbent branching evergreen suffruticose plant, with lanceolate-elliptic leaves, usually glabrous, and simple racemes of yellow flowers. Native of the Alps. Introduced in 1816. Flowers from June to August. It is the *Cistus oelandicus* (Linnæus).

Helianthemum origanifolium, Persoon (marjoram-leaved Sun Rose).—A small trailing evergreen suffruticose plant, with branching stems, ovate hairy leaves, and short terminal racemes of small yellow flowers. Rather tender. Native of Spain. Introduced in 1795. Flowers abundantly in June and July. Called also *C. origanifolius* (Lamarck).

Helianthemum ovatum, Dunal (ovate-leaved Sun Rose).—A procumbent evergreen suffruticose plant, with numerous branches, elliptic-lanceolate stalked silky leaves, and yellow flowers. Native of the Alps about Genoa. Introduced in 1818. Flowers from June to August. It is the *Cistus ovatus* (Viviani).

Helianthemum paniculatum, Dunal (panicled-flowered Sun Rose).—A small procumbent evergreen suffruticose plant, with ascending branches, ovate leaves hoary beneath, and racemes of small yellow flowers. Native of the mountains of Spain and Sicily. Introduced in 1826. Flowers from June to August. Rather tender.

Helianthemum penicillatum, Thibaud de Chauvalon (pencilled Sun Rose).—A small procumbent evergreen suffruticose plant, with hairy branches, ovate and linear-oblong hairy leaves, and racemes of very small yellow flowers. Native of France and Spain. Introduced in 1826. Flowers from June to August. Also known as *Cistus echioides* (Lamarck), *C. anglicus* (Linnæus).

Helianthemum pilosum, Persoon (pilose Sun Rose).—A small evergreen suffruticose plant, growing a foot and a half high, with somewhat erect branches, linear (or linear-oblong) hoary leaves, and paper-white flowers. Native of Spain and the south of France. Introduced in 1731. Flowers from May to July. It is the *Cistus pilosus* (Linnæus).

Helianthemum plantagineum, Persoon (plantain-like Sun Rose).—A hardy annual plant with erect hairy stems, eight or nine inches high, elliptic lanceolate hairy leaves,

and short racemes of yellow flowers. Native of Crete, Corsica, and north of Africa. Introduced in 1823. Flowers from June to August. It is also called *Cistus plantagineus* (Willdenow), and *C. serratus* (Desfontaines).

Helianthemum polifolium, Arnott (polium-leaved Sun Rose).—A branching evergreen suffruticose plant, six or eight inches high, with spreading hoary branches, oblong linear leaves, tomentose on both sides with revolute margins, and white flowers marked with yellow at the base of the petals. Native of England, Spain, France, Italy, and Germany. Flowers from May to August. This is the *Cistus polifolius* (Linnæus). *H. apenninum* (De Candolle), the *Cistus apenninus* (Linnæus), does not appear distinct from this.

Helianthemum polygalæfolium, Sweet (milkwort-leaved Sun Rose).—A sub-evergreen suffruticose plant, growing six or eight inches high, with ascending hairy branches, oblong-lanceolate leaves (upper ones linear-lanceolate), and yellow flowers. Rather tender. Native of Brazil. Introduced in 1823. Flowers in June and July.

Helianthemum procumbens, Dunal (procumbent Sun Rose).—A small procumbent branching plant, with the young branches hoary, alternate linear leaves, with hairy margins, and small yellow flowers. Native of the south of Europe. Introduced before 1825. Flowers from June to August.

Helianthemum pulchellum, Sweet (neat Sun Rose).—A small procumbent evergreen suffruticose plant, with hoary branches, roundish, or ovate leaves, beset with hairs at top and downy beneath, with the margins slightly revolute; the flowers are yellow in racemes. Native of Germany. Introduced in 1820. Flowers from June to August. It is also called *H. alpestre* (Sprengel).

Helianthemum pulverulentum, De Candolle (powdered-leaved Sun Rose).—A prostrate evergreen suffruticose plant, with hoary branches, oblong linear leaves with revolute margins, hoary beneath and glaucous above, and white flowers. Native of France, on sterile hills. Introduced before 1826. Flowers in May and June. This is the *Cistus pulverulentus* (Pourret), *C. polifolius* (Lamarck, not of Linnæus).

Helianthemum punctatum, Willdenow (dotted-petalled Sun Rose).—A hardy annual with downy stems six inches high, oblong hairy leaves, and long racemes of small yellow spotted flowers. Native of the west of France. Introduced in 1816. Flowers in June and July. The *Cistus punctatus* (Willdenow).

Helianthemum racemosum, Dunal (racemose-flowered Sun Rose).—An evergreen undershrub, growing a foot high, with erect hoary branches, narrow linear leaves with

revolute margins, hoary beneath and shining on the upper side, and large white beautiful flowers. Native of Spain, Barbary, and Teneriffe. Introduced before 1828. Flowers from July to September. Requires slight protection. *H. farinosum* (Sweet) is probably not distinct as a species from this.

Helianthemum ramuliflorum, Michaux (branch-flowered Sun Rose).—An erect herbaceous perennial, growing a foot high, with hairy stems, lanceolate, elliptic, or oblong leaves, hoary beneath, and yellow flowers. Native of North America. Introduced in 1823. Flowers from June to August. Also called *Cistus virgatus*, (Thibaud de Chauvalon).

Helianthemum rodanthum, Dunal (red-flowered Sun Rose).—A small procumbent evergreen suffruticose plant, with branches somewhat hoary, oblong leaves with revolute margins, hoary beneath, and racemes of beautiful bright red or rose-coloured flowers. Native of Spain. Introduced in 1800. Flowers from May to August. Also known as *Cistus roseus* (Jacquin). There are some slight varieties, all very handsome plants.

Helianthemum roseum, De Candolle (rose-coloured Sun Rose).—A procumbent evergreen suffruticose plant, with downy branches, ovate lanceolate hairy leaves, downy beneath, and delicate rose-coloured flowers. Native of the south of Europe. Introduced in 1815. Flowers from June to August. There is a very pretty double-flowered variety called *multi-plex*, which is harder than the other; it is the *Cistus roseus*, (Allioni, not of Jacquin).

Helianthemum rosmarinifolium, Pursh (rosemary-leaved Sun Rose).—A small herbaceous perennial, growing about a foot high, with erect pubescent branches, oblong linear leaves, revolute at the margins and hoary beneath, and minute crowded pale yellow flowers. Native of North America. Introduced in 1823. Flowers in July and August.

Helianthemum rugosum, Dunal (wrinkled-leaved Sun Rose).—An erect evergreen under shrub, growing three feet high, with hoary-branches, obovate-oblong downy leaves, somewhat toothed, and bright yellow flowers with a dark spot near the base of each petal. Rather tender. Native of Spain. Introduced in 1800. Flowers from June to August.

Helianthemum salicifolium, Persoon (willow-leaved Sun Rose).—A hardy annual, with erect, hairy stems six inches high, obovate-oblong downy leaves, somewhat toothed, and yellow flowers. Native of Spain and Italy. Introduced in 1749. Flowers in June and July. It is also known as *Cistus salicifolius*, (Linnæus).

Helianthemum sanguineum, Lagasca (bloody-stemmed Sun Rose).—A hardy annual, with a clammy pubescent stem six or

eight inches high, ovate roughish leaves, blood coloured beneath, and small yellow flowers. Native of Spain. Introduced in 1826. Flowers from June to August. Also called *Cistus sanguineus* (Lagasca), *C. pusillus* (Lambert), and *H. retrofractum* (Persoon).

Helianthemum scabrosum, Persoon (rough Sun Rose).—A somewhat erect sub-evergreen undershrub of about three feet high, with downy and hoary branches, oblong-ovate leaves with revolute margins, and fine rich yellow flowers. Native of the north of Portugal. Introduced before 1775. Flowers from June to August. Also called *Cistus scabrosus* (Aiton).

Helianthemum serpyllifolium, Miller (wild-thyme-leaved Sun Rose).—A trailing sub-evergreen suffruticose plant, with ascendent branches, oblong-elliptical leaves with revolute margins, hoary beneath, intensely green and shining on the upper side, and racemes of large yellow flowers. Native of the alps of Styria and Austria, and the mountains of Spain. Introduced in 1781. Flowers from May to September. It is the *Cistus serpyllifolius* (Linnæus).

Helianthemum squamatum, Persoon (scaly Sun Rose).—A small branching evergreen suffruticose plant, growing nearly a foot high, with erect silvery leprous branches, oblong silvery leaves, and racemes of yellow flowers. Rather tender. Native of Spain and Barbary. Introduced in 1815. Flowers in June and July. It is also the *Cistus squamatus* (Linnæus).

Helianthemum stæchadifolium, Persoon (French-lavender-leaved Sun Rose).—A small evergreen undershrub, growing a foot high, with upright hoary branches, oblong-linear greyish leaves with revolute margins, and racemes of yellow flowers. Native of Spain and Corsica. Introduced in 1816. Flowers in June and July. It is the *Cistus stæchadifolius* (Brotero).

Helianthemum stramineum, Sweet (straw-coloured Sun Rose).—A low procumbent evergreen suffruticose plant, with downy branches, flat roundish ovate leaves (upper ones oblong lanceolate), hairy above and downy beneath, and racemes of straw-coloured flowers. Probably a hybrid. Flowers from May to August. There is a very beautiful variety called *multi-plex*, which has double straw-coloured flowers, with the petals orange coloured at the base.

Helianthemum strictum, Persoon (straight-branched Sun Rose).—An erect suffruticose evergreen plant, growing a foot high, with straight hoary branches, narrow linear hoary leaves, with revolute margins, and white flowers. Rather tender. Native of Spain. Introduced in 1820. Flowers in June and

July. It is also called *Cistus strictus* (Cavanilles).

Helianthemum sulphureum, Willdenow (sulphur-coloured sun rose).—A small procumbent evergreen suffruticose plant, with lanceolate flat downy leaves, and racemes of pale yellow or sulphur-coloured flowers. Native of Spain. Introduced in 1795. Flowers in June and July.

Helianthemum tauricum, Fischer (Taurian Sun Rose).—A procumbent sub-evergreen suffruticose plant, with long hairy branches, oblong lanceolate hairy leaves, somewhat revolute at the margins, and large pale yellow flowers. Native of Tauria. Introduced in 1820. Flowers from May to October.

Helianthemum thymifolium, Persoon (thyme-leaved Sun Rose).—A small procumbent plant, very desirable for pot culture, having procumbent stems, pubescent branches, short linear pubescent leaves, and a profusion of small bright yellow flowers. Rather tender. Native of Spain. Introduced before 1658. Flowers from June to August. This is the *Cistus thymifolius* (Linnæus).

Helianthemum tomentosum, Dunal (tomentose Sun Rose).—A small trailing suffruticose evergreen plant, growing a foot high, with ascendent hoary branches, lanceolate oblong leaves, with revolute margins, usually hoary beneath, and racemes of yellow flowers. Native of Scotland, and of Spain and France. Flowers in July. It is regarded by some as a variety of *H. vulgare*.

Helianthemum Tuberaria, Miller (plantsain-leaved Sun Rose).—A herbaceous perennial, with ascendent stems, growing eight or nine inches high, with ovate oblong root leaves, those of the stem being lanceolate, and panicles of yellow flowers. Rather tender. Native of Italy, Spain, and Portugal. Introduced in 1752. Flowers in July and August. It is the *Cistus Tuberaria* (Linnæus).

Helianthemum umbellatum, Miller (umbellate-flowered Sun Rose).—An evergreen branching undershrub, growing about a foot high, with linear-oblong clammy leaves, downy beneath, and having revolute margins, and white flowers, growing in whorled racemes at the ends of the branches. Rather tender. Native of Spain, Portugal, and France. Introduced in 1781. Flowers from June to August. Also known as *Cistus umbellatus* (Linnæus), and in gardens sometimes as *C. Libanotis*. There are two varieties recorded; one, *erectum*, with erect branches; the other, *subdecumbens*, with the stem somewhat decumbent.

Helianthemum variegatum, Sweet (variegated Sun Rose).—A small procumbent evergreen suffruticose plant, with downy and hoary branches, lanceolate flattish leaves,

hoary beneath, and various coloured flowers, "some being nearly all red, others variegated with dark and light red and white, and others altogether white." An accidental hybrid. Raised before 1827. Flowers from May to October.

Helianthemum venustum, Sweet (handsome Sun Rose).—A small procumbent evergreen suffruticose plant, with glabrous warted branches, oblong-lanceolate flat scabrous shining leaves, hoary beneath, and handsome crimson flowers. Native country and date of introduction are not certainly known. Flowers from June to September. A very beautiful kind.

Helianthemum versicolor, Sweet (various-coloured Sun Rose).—A small evergreen undershrub, growing upwards of a foot high, with erect hoary branches, oblong flat leaves, hoary beneath, and variable coloured flowers, some being bright red, others nearly yellow, some copper coloured, and others of a mixture of all these colours, and of different shades between them, so that a plant in flower has a curious variegated appearance. Native of the south of Europe. Introduced before 1829. Flowers from June to August.

Helianthemum villosum, Thibaud de Chauvalon (villous Sun Rose).—A hardy annual, growing six inches high, with hairy stems, oblong lanceolate downy leaves, and racemes of yellow flowers. Native of Spain. Introduced in 1823. Flowers from June to August. Also called *Cistus villosus* (Thibaud), and *C. annuus* (Lambert).

Helianthemum vineale, Persoon (vineyard Sun Rose).—A small trailing evergreen suffruticose plant, with hoary branches, ovate oblong leaves, green above, hoary beneath, and racemes of pale yellow flowers. Native of the south of Germany, Switzerland, France, and Spain. Introduced in 1817. Flowers from June to August. It is the *Cistus vineale* (Willdenow).

Helianthemum violaceum, Persoon (violaceous-calyxed Sun Rose).—A small suffruticose evergreen plant, with much branched erect stems, the branches opposite and hoary, small almost linear leaves, with revolute margins, hoary beneath, and loose racemes of white flowers, slightly tinged with violet. The name applies to the violaceous calyx. Native of Spain. Introduced in 1826. Flowers in June and July. It is the *Cistus violaceus* (Cavanilles).

Helianthemum virgatum, Persoon (twiggy Sun Rose).—An evergreen suffruticose plant, growing nearly a foot high, with erect, twiggy, hoary branches, linear leaves, with revolute margins, hoary beneath, and beautiful large pale rose-coloured flowers, with a yellow spot at the base of the petals. Native of Barbary.

Introduced in 1818. Flowers from May to August, and ripens seed. There are two forms of this plant: *albiflorum*, with white petals; and *roseum*, with pale rose-coloured petals.

Helianthemum viride, Tenore (green-leaved Sun Rose).—An evergreen undershrub, growing a foot high, with ascendent glabrous stems, linear glabrous pale green leaves, with revolute margins, and racemes of yellow flowers. Rather tender. Native of Sicily. Introduced in 1825. Flowers in June and July.

Helianthemum vulgare, Gærtner (common Sun Rose).—A small procumbent evergreen suffruticose plant, with elongated branches, somewhat orbicular leaves, (upper ones oblong,) hoary beneath, and loose racemes of yellow flowers. Native of dry, chalky places in Britain, and throughout Europe. Flowers in July and August. Also called *Cistus Helianthemum* (Linnæus). A variety called *surrejanum* (*Cistus surrejanus* of Linnæus), has lance-shaped jagged petals. There is also a handsome pale yellow double-flowered variety; and another, called Lee's New Double Yellow, with dark yellow flowers, both of which are very beautiful.

The perennial sorts grow freely from cuttings under a hand-glass or bell-glass, and may be prepared for striking by first selecting the shoots that do not flower; shorten these to about four pair of leaves, take off the two pair of lower ones, and cut up the bottom to the under part of the joint. These must be shaded, watered a little, the glasses wiped every morning, and when the shoots have struck well, they may be potted into wide-mouthed sixty-sized pots of light sandy loam, dung, and broken potsherds, about as large as peas, of each equal parts, and all mixed. The tops may be taken off, the pots placed in the shade till the plants have got hold and established themselves, when they are to be kept barely moist at the root until planted out in their final situations. We have given a long list of species, as they are called, but we have very little doubt that three-fourths of them are only seedling varieties; for any one who will be at the pains of raising them from seed, will procure varieties which differ far more from each other than many of those called species. To raise them from seed, gather the seed, and sow immediately; sow in large wide-mouthed pots, because the body of soil holds moisture enough for the *Helianthemum* for a long time without artificial watering. When the seedlings are large enough, prick them out an inch apart, and when they are too large to grow so close any longer, pot them off as you would cuttings that have struck. A cold frame is all that

most of them require; but to save the trouble of planting and taking up, and protecting in pots and frames, let those which are out be covered a foot thick with good open litter, such as peas-haulm or broken straw, so that the light may not be excluded altogether, though the plants will be protected from excess of wet, and from cold winds, frost, and snow. Still many would take no other pains than striking cuttings enough to plant out the next year, and letting those already out take their chance; and considering that they are as easily struck as verbenas, or any other of the bedding-out plants, it is as well to do so as to take too much trouble to preserve them where they stand. How far the subject is worth the trouble, is for the cultivator to decide; so far as we are concerned, we should only be inclined to grow them in a very secondary or wilderness-like border, which required something of all sorts; or, if we had any quantity of rock-work, some of the most striking varieties to embellish it. During the wintering in pots they must be kept tolerably dry, as well as free from cold winds and frost. They may be planted out in the middle of May. Cuttings may be taken at any time from the shoots that do not indicate bloom; but June is a good month, and just before taking up time—say September. They strike well enough to go through the winter in pots, and to form good plants by the spring, while those taken in June may be continued in pots all the winter, and will therefore be far stronger than autumn cuttings.

ANGELONIA ANGUSTIFOLIA.

Angelonia angustifolia, Bentham (narrow-leaved Angelonia).—Scrophulariaceæ § Antirrhinidæ-Hemimeridæ.

This new species of *Angelonia* has been already briefly noticed in the *Annals of Horticulture* for 1847, at p. 526. It is there doubtfully spoken of as an annual species, and this doubt proves to be well founded, for it is now known to be a perennial of subshrubby habit. It may be regarded as one of the best of the genus *Angelonia*, all the cultivated species of which are handsome plants.

Our subject forms a small bush of about two feet high, its upright stems producing at their apex a large terminal raceme of blossoms. The plant is in every part perfectly free from hairiness. The stems are clothed with narrow lance-shaped leaves, which are slightly though distinctly saw-edged, and grow out in an opposite arrangement from the stem. At the top, these stems are furnished with an elongated raceme of blossoms; these are large, and densely arranged, so as to have a very

ornamental character ; the colour is deep violet, with a green throat. The flowering season is from June till October.



It is a native of Mexico, in which country Mr. Hartweg collected seeds which were sent to the Horticultural Society in the early part of 1846. From these seeds plants have been raised, which on producing their blossoms proved to be very ornamental. The plant is not strikingly different from its congeners, although a very desirable species, from its dwarf habit.

The Angelonias require the assistance of a stove temperature to secure their full development. It is not, however, so much the constant and extreme heat maintained in hot-houses, which they require, as it is a moderate degree of stove-heat when they are making their growth in the spring. After that is secured, and the blossoms are formed and partially developed, they may with perfect safety be placed in an ordinary greenhouse, where very slight shelter is afforded them. They flower during the summer and autumn, and remain for a long time in bloom. When this is past, they should be kept rather drier than is desirable at other periods, although they must not be at any time allowed to become shrivelled or dried up for lack of moisture. In this condition they should remain during winter, being placed in a cool and dry situation in the stove, or in a warm greenhouse. Towards the end of February the plants should be more liberally watered, and placed where more heat may influence

their development. At the same time, any long straggling shoots should be cut away, so as to reduce the plants to an orderly shape. They may then be re-potted if the roots are numerous, but if not, this operation may be delayed for a time. When new shoots are formed, the tops of the most vigorous should be taken off, so as to keep them bushy, as from the habit of the plant this cannot be done at a very late period, for fear of destroying the bloom, which is produced late in the season along the stronger shoots of the present year. The consequence of stopping the strong shoots early, is only to produce other shoots of sufficient vigour, which reach a blooming state somewhat later than the original shoots would have done: hence, stopping produces a succession of bloom, if some plants are so treated, and others left undone—a consideration of some importance where a display of ornamental plants is required to be kept up. The compost for these plants should consist of a mixture of three parts turfy peat to one of turfy loam, the whole intermixed with a little sand to render it porous. The pots must be well drained, as these plants are very susceptible of injury from stagnant water about their roots; and, for the same reason, pots of too large a size for the number of the roots should be avoided, this being an almost certain source of injury. Both phases of the evil may be avoided by using an abundant supply of broken potsherds in the bottom of the pots, placing over these some rough soil to prevent the finer from intermixing with them; and by shifting only when the pots become pretty well filled with roots, and then only into others slightly larger than those from which the plants are taken.

Propagation is very easily effected among these plants, by means of cuttings, which should be taken from among the smaller lateral shoots; they should be planted in sandy soil, and placed in a hot-bed frame, or close propagating house till rooted.

SUGGESTIVE HINTS.*

WE have rarely perused a book of this educational class with more pleasure than we experienced in reading the Reverend Mr. Dawes's "Suggestive Hints towards Improved Secular Instruction." It is one of those works which clothe instruction in the most inviting garments, and would reconcile even an idler to an attempt at learning; but it is a

* "Suggestive Hints towards Improved Secular Instruction, making it bear upon Practical Life. Intended for the use of Schoolmasters and Teachers in our Elementary Schools." By the Rev. Richard Dawes, A.M. Second Edition. London: R. Groombridge and Sons, 5, Paternoster-row. Dublin: J. M'Glashan.

book for schoolmasters. It is as profitable to the teacher as to the student, and really offers an inexhaustible fund of wholesome advice to all concerned in the education of children. It has exhausted all the ideas upon the subject; there is no room for another thought upon the matter. All that can be done to make education entertaining, all that can be thought of to inspire the young mind with a desire of knowledge, seems to be concentrated in this little work. We quote a chapter on Natural History as an example.

"The subject of natural history, both of plants and animals, so far as they differ from each other in external form, in habits, &c., may be turned to very good account, and made the means of a great deal of useful instruction in our elementary schools.

"The children here are in the habit, as the spring and summer advance, of bringing to the school plants and flowers when they first come out—small twigs of the different trees of the parish, as the foliage begins to expand—aquatic and other plants; all these, so far as a knowledge of them can be had from the organs of vision, with a little of the mind and of common sense to help it, are made vehicles of instruction.

"For instance, the names of the different parts of a flower, from its root upwards, and the functions which each part performs—the nature of the root, whether bulbous, fibrous, or tap-rooted—the uniformity in number of the petals, stamen, pistil, &c.—running through the same class of plants; difference in the shape of leaves—some are notched, and some are plain—some rough, others smooth, some oval, some round, some bright green, others dark—the under side of the leaf differing in colour from the upper, &c.; the different kinds of soils on which they find the wild plants—showing that the soil on which any particular plant is generally found is, most likely, one best suited to its habits; that some plants, and pointing out which (this they ought to know from their own observation) are only found in shady places, while others will not grow at all in the shade; that, when a flower or a leaf withers, this is from the juices making their escape into the atmosphere, and the plant being separated from its roots, cannot get a fresh supply; how aquatic plants, differing in structure from those on dry land, in their air-cells, are calculated to make them float,

"Then again, the small twigs of the different trees or shrubs they may bring—the oak, and the elm, and the beech—place a little twig of each side by side, how many differences in external appearance—in the leaf, the bark, the texture of the wood—the bark of the oak

used for tanning, and the difference in time in the leaf coming out, and in its fall—the value of each as timber.

"The acacia and the laurel—beauty of the leaves; how uniformly the leaflets of the acacia are set on, one opposite another; how regularly in some plants the leaves are placed directly opposite to one another; others, again, alternating on opposite sides of the stem; point out the framework of the leaves, how the skeletons of them differ—to observe this in decayed leaves.

"Another morning they bring different twigs of the pine tribe—the larch, the Scotch fir, spruce, or silver fir—pointing out their thread-like leaves—that the larch is deciduous, the others not, &c. In this way they become acquainted with all the trees in the parish. That when a tree is cut down, the number of concentric rings on the face of a section of the stem marks the number of years' growth; that when they observe one ring smaller than another, it would denote a small growth for that year, and might have been caused by some peculiarity in the season, &c., such as a hard winter.

"The great age of some trees, particularly yew.

"These kind of observations should be made with the plants before their eyes, otherwise they have but little effect; the teacher would then tell them to sit down and describe a leaf, a twig, &c., of any of them; or some take one, some another, which is better, as this does away with the temptation to get hints from each other.

"Again, calling their attention to some of the more striking differences in animals in their outward appearance and habits—the migrating of birds, and when they return, getting them to observe it; difference in the teeth and in the articulation of the jaw in animals of prey, and of those which ruminates, the jaw of the latter being capable of a rotatory motion, which enables them to grind, the other not, and having long tearing teeth; the air-cells in the bones of birds so beautifully adapted to the purposes of flight; the feathering of water-birds, the down on their breasts, the peculiarity of their feet, and how differing from the feet of those that roost, &c.

"But more particularly will a teacher interest his school in this department by making observations of this kind, and comparisons, &c., among the birds they are in the habit of seeing—such as the cuckoo, swallow, tom-tit, skylark, woodpecker, jay, or ducks and geese.

"In this way they become observers of the external world with which they are in contact; it adds both to their happiness and to their usefulness, inasmuch as all these things have a practical bearing on social life."

THE FOOD OF PLANTS.

PLANTS take in food only when it is dissolved in water, and they only take in that which is fitted for them. If the proper food be scarce, the ground is for that plant poor; different plants require not exactly different kinds of food, but different proportions of the same things. Still it must be borne in mind that all sorts of dung are rich in the food, for, in fact, it is composed of the produce of the earth returned to the earth. This must be acceptable to plants again, at least so much of it as the plants require. By the same reasoning all decayed vegetables must contain proper food for another generation of individuals; and animal substances are good for the land, for it is from the earth as much as vegetable. Sheep and cattle live on vegetable food, yet they retain all they can convert to bone, flesh, fat, horn, hair, or blood. In short, everything comes of earth, and returns to earth; and supposing we were to sow a field with a green crop, and buried it instead of taking it off, the land would be richer instead of poorer for the operation; because the plant assuredly returns what it took from the soil, and all that it obtained from the rains, which of themselves contain the food of plants in abundance. We do not agree with those who say that a certain crop takes so much of this, that, and the other, from the soil, and therefore the same things must be returned to the soil, because we believe the plants take an immense quantity from the atmosphere, brought down by the rains. Our reasons are these: there is a poor sandy dry soil sowed and planted with part oats, and part potatoes; the crops are thin and short, the season being dry; the next year there is a wet dripping season, and both the oat and the potato crops are trebled;—treatment the same both seasons—and the land always yields good or bad crops, according to the wet or dry season. But it may be said that the wet only dissolved the food already in the earth, and that any other wet would have done as well as rain. It is well known, however, that rain-water is far more nourishing than any other, and that it is impossible to supply the place of rain by anything but liquid manure; so that, to be as good as the rain, the food of plants must be dissolved in water, which at once settles the point that rain brings down with it from the atmosphere much of that food, which is all ready for the plant to imbibe, and which accounts for that extraordinary progress which all vegetation makes within a few hours after a genial shower. On this account we are great friends to liquid manure in the absence of rain; we have not half so much faith in plain water; but inasmuch as rain-water is by no

means strong, neither should liquid manure be too potent; a peck of decomposed cow-dung, the mildest of all animal manure, or nearly so, in thirty-six gallons of water, is sufficient. This may be stirred twenty-four hours before it is used, and again just before use; and no matter what it is applied to, it must do good—strawberries, peas, beans, spinach, lettuces, anything; they will, if the ground be well soaked all round, grow rapidly; but plain watering only appears to keep things from going back, it does not seem to hasten them. Half a pound of muriate of ammonia in the thirty-six gallons of water, and things well soaked with it once, to four or five times of plain water, is also a great fertilizer, but ought by no means to be used twice without plain watering four or five times between. But we must notice here, that rain-water does not improve by standing; no application is equal to the shower itself. It cannot be collected for use by hand without collecting in its way much that is useless, and losing, by keeping, much that is really useful. Even these few hints are useful to those who have not paid attention hitherto to the food of plants.

THE FORCING OF GRAPES.

SUPPOSING a house devoted to grapes, and we were desirous of having several seasons of fruit, there is nothing more simple than the required management. But it should always be remembered that the same plant should always be forced in the same degree, and by such means it is never cheated of its season of rest. We are not going now to describe a thing actually carried out, but contrary to our general mode of doing things, we are starting a theory to explain a practice that we have adopted at separate periods, but which we have never fully developed in one house. The grape we have chosen for our experiment is the black Hamburg, a grape that is a universal favourite, not less for its beauty than its flavour. Plant as many vines to your house as you have rafters to the roof; grow but one branch to each rafter; construct your house so that you can withdraw this branch from the inside, and keep it for a while outside whenever you please. This branch has to be renewed every year, so that, inside the house you have the branch which has fruit, and the shoot which is going to supply its place next year growing by the side of it. Now, the regulation of the seasons for the different grapes may be thus planned:—Plant the vines outside, and contrive to take them into the house close under the roof, by leaving out one pane of glass, and providing

some means of stopping up the vacancy round the stem when it is in; the same vacancy will enable you to draw out the vine whenever you wish it. Say one-third of the vines are put in the house at Michaelmas, one third in January, one third in May; keep the house up to forcing heat always; as soon as the single shoot of the Michaelmas vine has grown fully to the length of the rafters, top it, and when the leaves turn, draw it out of the house through the vacant space left for it, (and only temporarily filled up to keep the air out,) and there let its wood ripen. In like manner, when the vines taken into the house in January are in the same state, that is to say, the shoots have grown the length of the rafters, top them, and when their leaves turn, draw the shoots out of the house. So also with the third lot put in, in May. Replace them in the house at a proper season, that is to say, the same time as the previous year. There may be bunches of grapes on the vines when the side shoot intended to bear the next year is withdrawn, but this need not be disturbed until the grapes are off, when the vine may be cut away to just above the shoot. It may, however, be necessary to disturb the bearing part before you can draw out the young branch. This will not matter if half of it were drawn out, so that the part which

had the grapes on were inside; and if there were any half way up, it is clear that the vine might be dragged half way out before it would withdraw any grapes. This is mentioned because many people keep the grapes hanging as long as they can; and it will not interfere with the bearing branch for the next year if they do so. The contrivance for withdrawing the vine is not new, but very few practise it where they can afford to keep separate houses for the different seasons; and wish, however, you have but one house, and wish the grapes to come at different seasons, this is the only way that we know of. As soon as the grapes are off, you may either draw the fruiting part out, and cut it off at the time you put the new branch in, or you may cut it off directly. It is to be observed, that the great object is to be exact with the several seasons of returning the new branch to the house; and the temperature of the house must never materially vary, except when the sun is powerful and raises the temperature more than usual, but these are the times to give air. Nothing need be done to the branch when returned to the house but laying it along the rafter by means of staples, and cords or wires; the treatment in other respects the same as usual. Here will be three seasons of grapes, lasting nearly the whole year in perfection.

THE INTERESTS OF FLORICULTURE.

WE have said "interests," for there are several. Properly maintained, all the interests may be served, but as things are, one is only served at the expense of another. The most distinct of these interests are, first, that which tends solely to the advancement of the science; secondly, that which appertains to the fair trader; thirdly, that which leads solely to the gain of the dealer without principle; fourthly, that which belongs to the enthusiastic amateur; lastly, that which affects the young beginner. Much as it is to be regretted, these interests act different ways, as the floricultural world now jogs, and each must be treated of separately and distinctly. That which tends solely to the advancement of the science affects all a little, but consists chiefly of emulation and honourable rivalry; whoever, therefore, promotes this, promotes the true interests of the science. It is the spirit of emulation, the ambition to excel, the desire to be tried by the test of honourable distinction, and the assurance that others are dealing with us in the same way, and with the same notions, that incites us to adopt all the honourable means of promoting our own superiority. Whatever disturbs this feeling of the cultivator, checks his ambition to compete, lowers his estimate of reward, damages

his good opinion of human nature, excites a contempt for his inferiors, and therefore reduces the credit of surpassing them. But the confidence of gentlemen who have entered the arena with the intention of competing fairly, has been so shaken by the unfair means used for their defeat, that thousands who began to contend for the prizes of Horticultural Societies, have been disgusted by the utter hopelessness of fair dealing; and it is a rare thing now to see gentlemen contending in general Societies for prizes at all. When we say gentlemen, we mean persons who in private life move among gentlemen, and in public matters are guided by the rules which regulate good society. Thus, the class of persons most able and most willing to advance the science, are so offended with the trickery and the various contrivances which supersede everything like honourable and fair competition, that they decline entering the lists, after two or three attempts, and content themselves with the quiet enjoyment of their gardens at home. The number of enthusiastic and liberal persons who have been checked in their endeavours to surpass one another, would form a sad account of friends estranged. We could make a formidable list of those we know, gentlemen who cared nothing about the cost

of a good thing; who had no notion of limiting their garden expenses; men who wished to have the best of everything at any cost; who, seeing no more chance of reward for the best than for the worst productions, retired from one Society after another, and at length contented themselves with their gardens at home, and no longer sought to be the first purchasers of new subjects, because there was no longer an inducement to be first in the field of competition. The withdrawal of so much of the very spirit of Floriculture from the arena of the science was an evil far beyond the calculation of many; for, with their retirement, the benefit of their example was lost, and we all know example goes further than precept. If Mr. A., a gentleman of independent fortune, would no longer buy a tulip at ten pounds, or a dahlia at ten shillings, Mr. B., a wealthy tradesman, declined quite as readily, and with more reason; and Mr. C., a florist, who liked to have everything that was likely to sell, cared very little about a thing that Mr. A. and Mr. B. would not purchase till it was cheaper; so that the raiser found only half, and sometimes not half, the customers he used to have, for anything novel. Nothing will bring floriculture to its former state of rapid advancement but the restoration of confidence among that class of gentlemen who are above profiting by the profligacy of the managers of shows, and scorn to enter the lists with sharps and cheats. This powerful interest we fear is permanently damaged. In proportion as men are raised above their compeers does the difficulty of reclaiming them increase; and the instant a man declines showing, his enthusiasm tames down to quiet admiration, which he indulges in at home, and into a sort of contentment, without the novelty for which all competitors thirst. This is one of the interests that has been damaged. Emulation to excel has been thus destroyed in a large and influential class that did more for the advancement of Floriculture than any other, because all the other classes, more or less, depended on them, and followed their example. Thus, then, the destruction of emulation in this class damaged it in all the others, because there ceased to be the excitement, and that great interest which caused the advance of the science was, we fear, permanently damaged. The interest, as it affects the fair trader, could not but be seriously affected by the apathy of the gentry and wealthy showers; but it was not destroyed, because there were still exhibitors, although they wanted that high honourable feeling which the better class infused into their meetings. Again, they were more limited in their means, less scrupulous in their dealings; those who never meant to pay, were still libe-

ral in their orders, and they who meant to be a long while about it favoured too many with their notice. Again, the creation of new dealers from a race of men brought up to the loom or the factory, greatly undermined the interest of the fair trader, not merely by additional competition, but by damaging the respectability of the trade. Amateurs of all kinds set up as florists, some because, as they alleged, the dealers would not give them a fair price for anything they raised; some, because it was an idler life than working at a business; some because they thought it all profit, and some because it afforded a legal opportunity of cheating. These men created an interest among their own class, but soon found it decline. This class of dealers considered it no crime to describe a thing falsely to get a good price for it, and defraud the buyers. But there is a class of enthusiastic amateurs, who still grasp at anything new and good, and who feel sadly vexed and annoyed when a promised novelty, of considerable price, proves worthless. This class was anxious to order every thing that they could learn, from any authentic source, was good; but they have been so often deceived by the catalogue description, that they heed dealers now but little. There have, however, been select lists published by some authorities which have led to the greatest deception. Prizes have been given for new things infinitely worse than old ones, and the dealers have been enabled, by this means, to impose upon the public easily; for they had only to state that it had a first prize here, or a principal prize there, and the public, thinking prizes were given only for subjects of merit, fell into the trap laid for them at once. But the dealers were not in this so much to be blamed. The dealers are not good judges, otherwise respectable men that we could name would never describe a worthless thing as a first-class flower. The persons who act as judges at societies are too often grossly mistaken, or vilely dishonest. If a dealer gets a prize he has a right to boast of it; and as he is really not a judge himself, he may be perfectly innocent of any fraud in putting off a trumpery subject, not worth a penny, at the price of good things. But, all this tends to wean the buyers, and lead them to doubt everything new. The consequence is, that the dealer, instead of selling five hundred plants of a novelty at half-a-guinea, sells one hundred, and them principally among the trade, who all sell the same thing next year at two shillings, or less. Thus even enthusiasts decline the honour of being hoaxed, or risking it, and the dealers are minus. But, lastly, there is an interest that wants cultivating and is neglected—the interest attached

to, and dependent on, the treatment of young beginners ; and on this subject we have to regret that, important as is their encouragement, they have been constantly ill-used if they have trusted to some dealers. There is a notion among a certain class of florists, that worse things will do for young beginners than will do for good judges. This is a discreditable feeling. It is quite certain they do not know so well, and therefore cannot detect so easily the inferiority of a flower ; but there is no good reason why the beginner should not have as good a collection as can be had, and start even, instead of being served with such as others began with ; and the plan of putting them off with worse has been so nearly universal, that one-half even of the young beginners have been disheartened and discouraged by their very first purchase, and have given up the pursuit in dudgeon. This powerful interest has, therefore, been discouraged by the very people who most depended on their favours, and that for the sake of a paltry advantage, worse than the ripping up of the goose to get all the golden eggs at once. Thus have all the interests of floriculture severely suffered and declined ; and, but for one circumstance, would have been destroyed altogether. The Garden Almanac, which has been published for some years, has been the means of checking, in some measure, the downward movement. In that work have appeared lists of a small number of flowers, plants, fruits, and vegetables, worthy of general cultivation, and especially of new things which bore great prices. These lists have enabled thousands of persons, whose means were limited, to venture upon a few novelties. We are in possession of the names of many persons who order everything recommended in that work, who do not scruple to write their commands direct from its pages, and it is acknowledged that they are never disappointed. This, then, has done the science some service ; for it has been declared, over and over again, that had not those lists appeared, many would have waited until the next year. It is much to be regretted that those directly interested in floriculture do not take more pains to cultivate the good opinion of amateurs, for if they did, we should not see the trade in the state it now is ; nurserymen figuring in the gazette, or sold up against their will ; nurseries not paying their expenses, and to let ; the whole body complaining that they can get no money from each other ;—a state of things undeniable as it is deplorable ; and all may be traced to a neglect of those things which are necessary to be taken care of, a carelessness in the treatment of the people on whom they mostly depend, and a reliance on that which never did and

never will serve them permanently—the praises and misdescriptions of worthless things to be sold as first-class novelties. To such a height has this been carried, that whoever was honest enough to give a proper description was considered an enemy ; and the very lists of good things that have been published for the guidance of the inexperienced, has been visited on the author by a hostile feeling, although it has been the most efficient means of preventing the interests of floriculture from being destroyed altogether.

CONTEMPORARY WRITINGS,

AND ORIGINAL NOTES CONNECTED WITH HORTICULTURE
AND NATURAL HISTORY.

ON FLOWERS AND FLOWERING SHRUBS.—What an appearance nature would present, divested of flowers ! To see the fields an unenlivened green, and not a flower waving on their bosom, what would be the charm of beholding the green leaves ? Flowers vary the sameness ; beautiful as interesting, in gazing on their colours and striking forms, the mind insensibly feels relieved of every care, and is given up to delight in observing the surpassing display. Their absence would be deeply felt ; all would then be a dreary void, for which nothing would be able to compensate. As the lofty and sublime scene can only inspire the sensation of awe, it is in the calm retreat among the sylvan groves, surrounded by flowers and plants of every hue, and trees of varied foliage, that the pleasures of contentment can be felt. Yet still the many beauties of the floral world which should be included in the garden and pleasure ground, are passed almost unobserved—the simple flower, just hid among the leaves, or with dazzling blooms adorning the sunny bank, to the magnificent flowers of other climes, the elegant shrubs with their light and showy blossoms of every shade and size. Nothing can be more ornamental than a choice collection of the most splendid shrubs of different species : so that, from earliest spring to late in autumn, a grand series of successional bloom may be had. It is oftentimes surprising to see the want of taste shown in the selection of a few shrubs : instead of seeing some of the choicest ornaments in creation, some of the most uninteresting and inferior sorts take up their place. The great number of really beautiful shrubs now introduced, renders it unnecessary to cultivate those which have no merits to recommend them : there are many which should only exist in botanical collections. The *Ribes oxycanthæfolia*, *R. divaricatum*, *Viburnum dentatum*, *V. prunifolium*, *Cornus alba*, *C. mascula*, *Sambucus leucocarpus*, *Rhamnus alpinus*, *Prinus verticillata*, *Philadelphus*

nanus, *P. laxus*, *Hamamelis virginica*, have no beauty or ornament, and are unworthy of cultivation. Among the shrubs which have features of curiosity and splendour to entitle them to a place in the garden, are *Genista sagittalis*, *G. tinctoria pleno*, *Coronilla Emeryus*, *Halesia tetraptera*, *Rubus spectabilis*, *R. odorata*, *Tamarix germanica*, *Kerria japonica pleno*, *Cydonia japonica*, *Potentilla floribunda*, the different varieties of *Hibiscus syriacus*; among the *Ribes*, besides *aureum*, *Menziesii*, *nigrum variegatum*, and *speciosa*, all the varieties of *R. sanguineum*; the *Spiræas* are exceedingly pretty-flowered shrubs; *Sambucus splendens*, the Missouri Silver Tree (*Eleagnus argenteum*), the Lilacs, *Hypericum calycinum*, *H. Uralum*: many of the *Cytisuses* are very beautiful, and bloom several months; *Buddlea globosa*, *Berberis aristata*, *B. dulcis*, and *B. Aquifolium*. Some are highly fragrant, such as *Calycanthus lavigatus*, the *Jasmines*, *Daphne collina*, *D. pontica*, *Spartium junceum*, and *Chimonanthus fragrans*, &c.; most of these are well known, and are requisite in the shrubbery for show and effect. C. M.

RUSSIAN METHOD OF TRAINING APPLE, CHERRY, AND PLUM TREES, BY MR. JOSEPH BUSCH.—The severity of the winter at St. Petersburg is so great that few fruit trees will survive it, even with careful matting; to prevent the loss which is thus usually sustained, I have for more than twenty years pursued a mode of training which has been attended with complete success. It consists in leading the branches of the trees on horizontal trellises only ten or twelve inches from the ground. When the winter sets in there are heavy falls of snow; and as the frost increases, the snow generally augments, by which the trees are entirely buried, and receive no injury from the most intense frost. The winters of 1819 and 1820 were very severe, notwithstanding which, last summer, I had a great crop of apples, and all of the tender sorts, while none of the gardens in the neighbourhood produced any; even many of their trees, although doubly matted, were killed. From my green gage and Orleans plums I gathered ripe fruit on the 29th September last; I had also a very full crop of Morello cherries. Another very great advantage of training trees in the above method consists in the growth of the wood, it being of equal strength, and the fruit produced being all alike, the bloom comes out much earlier, and the crop ripens sooner. The trees are always clean and free from insects; I have observed this even while some standards near them have had their leaves curled by aphides. The only cherry that does not succeed in this way is our black-heart; this I attribute to the damps which affect the early blossoms, but in a

milder climate this injury would be obviated by placing the trellis higher from the ground. When the trellis decays under the apples, I never renew it, as the trees always keep (from the strength of their branches) their horizontal position. There are other advantages of training fruit trees in this manner: they come sooner into bearing, and their fruit is not affected by high winds. I never gather the apples, but let them drop off, for the distance they fall is not sufficient to bruise them. Probably pears trained in this way would answer well in England. [The objections are chiefly the rendering of the ground under them useless for any other purpose, the confusion a place must be always in where the trees are so trained, and the smallness of even the heaviest crop on a tree so disposed. There is nothing beats an espalier for neatness, quantity of fruit produced on the small space occupied by the tree, and the facility of gathering.]

LARGE PINE APPLES.—Five-and-twenty years ago the following note was communicated to the Horticultural Society by Mr. Walter Hogg, as his mode of treating some pine-apple plants which had grown to unusual size:—In March, 1820, he had several of different sorts, which had been suckers taken from the parent plants in 1816, and which, under the usual treatment, had become too large to receive proper sustenance while remaining in pots. To provide a fit place for them, he cut a deep trench along the back of the bark bed, into which he put a quantity of good earth, and then turned the pines out of the pots into it, and filled up round the balls with mould of the same quality, which he covered lightly with tan. At the time a few only of the plants were showing fruit, but they all (with the exception of one plant of the New Providence) fruited immediately, and extremely well, yielding fruit from 3lb. to 5½lb. each in weight. The plant of the New Providence continued growing luxuriantly till the following February, when it showed fruit, which was cut in June, and weighed 9lb. 4oz.

ADVANTAGES OF WHOLE SETS OF THE POTATO, BY THOMAS ANDREW KNIGHT, ESQ., F.R.S.—We were hardly aware that a practice which has prevailed with us for more than thirty years had received such a confirmation in 1828 as the evidence of its efficacy by the President of the Horticultural Society. It is true that we always used small tubers instead of large ones, but in both cases they are whole ones. The soil, says the writer, in which I proposed to plant being very shallow, and lying upon a rock, I collected it with a plough into high ridges of four feet wide, to give it an artificial depth. A deep furrow was then made along the centre and highest

part of each ridge ; and in the bottom of this, whole potatoes, the lightest of which did not weigh less than four ounces, were deposited, at only six inches distance from the centre of one to the centre of another. Manure, in the ordinary quantity, was then introduced, and mould was added, sufficient to cover the potatoes rather more deeply than is generally done. The stems of potatoes, as of other plants, rise perpendicularly under the influence of their unerring guide, gravitation, so long as they continue to be concealed beneath the soil ; but as soon as they rise above it, they are, to a considerable extent, under the control of another agent, light. Each inclines in whatever direction it receives the greatest quantity of that fluid, and consequently each avoids, and appears to shun, the shade of every contiguous plant. The old tubers being large, and, under the mode of culture recommended, rather deeply buried in the ground, the young plants in the early part of the summer never suffer from want of moisture ; and, being abundantly nourished, they soon extend themselves in every direction, till they meet those of the contiguous rows, which they do not overshadow on account of the width of the intervals. The stems being abundantly fed, owing to the size of the old tubers, rise from the ground with great strength and luxuriance, support well their foliage, and a larger breadth of this is thus, I think, exposed to the light during the whole season, than under any other mode of culture which I have seen ; and as the plants acquire a very large size early in the summer, the tubers, of even very late varieties, arrive at a state of perfect maturity early in the autumn. Having found my crops of potatoes to be, in the last three years, during which alone I have accurately adopted the mode of culture above described, *much greater than they had ever previously been*, as well as of excellent quality, I was led to ascertain the amount in weight which an acre of ground, such as I have described, the soil of which was naturally poor and shallow, would produce. A colony of rabbits had, however, in the last year, done a good deal of damage, and pheasants had eaten many of the tubers which the rabbits had exposed to view ; but the remaining produce per acre exceeded 539 bushels of eighty-two pounds each, two pounds being allowed in every bushel on account of a very small quantity of earth which adhered to them. Of the ashleaved kidney potato I selected the largest tubers which I could cause to be produced in the last year ; and planted them nearly in contact with each other in the rows, and with intervals, on account of the shortness of their stems, of only two feet between the rows. The produce of

the small early potato exceeded very considerably that of the large one above mentioned ; being per acre 665 bushels of eighty-two pounds.

[We have seen the late President of the Horticultural Society held up as the highest authority in the world, and therefore, though this only confirms the propriety of the practice of using whole tubers, it is important at a period when so many are disputing the point.]

AUTUMN AND WINTER RADISHES.—Our old gardeners, if we may rely on the authority of Gerard,* were acquainted with only one of the sorts of winter radish which were cultivated in the Society's Garden in 1820 ; it is called, in the work referred to, *Raphanus pyriformis sive radice nigro*, or the Black or pear-fashioned radish, and is certainly the same as our Black Spanish radish. The figure given of it by Gerard represents the root as it appears before it acquires the size at which it is fit for use. Miller, in the eighth edition of his dictionary, (1768) describes the *Raphanus niger*, or Black Spanish radish, as used in winter ; and almost every modern book on Horticulture also notices it. Another sort, the White Spanish radish, is slightly mentioned in a few Gardening books of recent date ; but it seems to be little used, for the Society received only one packet of it amongst the collections of radish seed from the British seedsmen, and that was supplied by Mr. Lee of Hammersmith, who received it from a foreign correspondent, by whom it was obtained from Augsbourg. Miller, in the edition of his dictionary above referred to, calls it the *Raphanus orbiculatus*, or White Spanish radish. I have not been able to ascertain how, or from what cause, they acquired the name of Spanish radishes. The seeds of these two sorts, as well as of the others which I shall now proceed to describe, were received from M. Vilmoren, in the collection of garden seeds which he sent from Paris for the use of the Horticultural Society.

1. *Le Radis Jaune.* The Yellow Turnip Radish has an oval bulb, with a mouse-tail root ; it grows large, to full four inches in diameter when old, but should be eaten young, and is then a good radish. The flesh is mild, crisp, solid, and quite white ; the outside is yellowish brown, the leaves grow upright and long, with footstalks of a light green.

2. *Le Radis Gris Rond.* The Round Brown Radish may be called round, though it is rather irregular in shape ; it grows large, and then becomes hollow ; it should, therefore, be used when young. The flesh is mild, rather soft, and of a greenish white ; the outside coat is mottled with greenish

* Gerard's Herbal by Johnson, page 238.

brown, the leaves grow upright and long, with green footstalks.

3. *Le Radis Gros Blanc d'Augsbourg*, is the same as the White Spanish Radish. It has an oval bulb, tapering into a tap root; it grows to a large size, and is good in that state. The flesh is rather hot, firm, solid, and white; the outside coat is white, tinged with green, and slight purple on the part which is exposed above the ground; the leaves are long, and tinged with purple on the footstalks.

4. *Le Radis Gris Oblong*. The oblong Brown Radish has a pear-shaped bulb, with an elongated tap root; it does not grow particularly large, and is harder than any of the preceding, and therefore fit for late use. The flesh is hot, firm, hard, and white; the outside coat is rough and brown, marked with white circles; the leaves are dark green, and rather spread over the ground; the footstalks are stained with purple.

5. *Le Radis Gros Noir d'Hiver*, or *Le Radis Raifort*, is our Black Spanish Radish; its bulb is oval, or rather regularly pear-shaped, with a long small tap root; at first the root is thin, but it swells as it advances in age, and acquires a large size. The flesh is hot, firm, solid, and white; the outside coat is rough and black, the leaves are long, and incline to grow flat on the ground; the footstalks are purple.

6. *Le Radis Gros Violet d'Hiver*. The large Purple Winter Radish is a beautiful variety, derived, without doubt, from the Black Spanish, and may therefore be properly called the Purple Spanish Radish. In shape and character it much resembles the Black Spanish Radish, but the outside, when cleaned, is of a beautiful purple colour, though it looks black when first drawn from the earth, and the coat, when it is cut through, shows the purple very prettily. The footstalks of the leaves have a much deeper tinge of purple than the other kind.

The above six kinds of radish will supply the table with variety in succession, through the autumn and winter, if the whole are sown in July, and brought into use in the order in which I have described them; those which are intended for winter use should be taken up in dry weather, in November, be divested of their leaves and fibres, and preserved in sand until they are wanted.

[This paper, by Mr. Christie, one of the gardeners in the Horticultural Society, introduces a few kinds of radish which are almost out of cultivation in England; but those curious in such things will find them well worth culture.]

STOCKS FOR ROSES; BUDDING.—The Dog-rose is generally recommended as the best

stock upon which to bud; but the buds of the China, Noisette, and other smooth-barked varieties, will take more readily and certainly on the Boursault; and it may be stated, as a general rule, that the nearer the bark of the stock and the bark of the rose from which the bud is taken agree in texture, the more certain is the chance of success. Acting on this principle, the writer selected, during the last winter, the best and strongest stocks he could find of the smooth barked green rose with white flowers, known as *Rosa avensis*, and supposed to be the parent of the Ayrshire rose. *Rosa avensis*, in many instances, grows too much in the manner of the bramble to be available; but by the river side, and in damp places, a vigorous straight stock of from four to five feet may readily be met with. In every instance in which he has inserted a bud upon the stocks of this rose, the bud has pushed forth sooner than the buds upon the stocks of the Dog-rose, and scarcely one failure has occurred. This may perhaps be accounted for in some measure from the readiness with which the bark separates from the wood, and from the close adhesion of the bark, owing to its thinness. Among the roses which have been thus budded this season with success, may be mentioned:—Bourbons: Bouquet de Flore, Pierre de St. Cyr, Dubourg and Gloire de Rosamène; Noisettes: Aimée Vibert, Eclair de Jupiter, and La Nymphe, and also the old dark China; of these, Aimée Vibert and Eclair de Jupiter have made good heads, and are now (5th of August) showing strong for blossom. Whether the stocks may be as durable as those of the Dog-rose remains to be proved. As a further experiment, the heads of a double white variety of the Ayrshire rose, budded last year upon two Dog-rose stocks, were reduced, and buds of Mrs. Bosanquet and Maria Leonida inserted on branches of the Ayrshire. These buds are also pushing and flourishing well. R. W. B.

ZAUSCHNERIA CALIFORNICA.

Zauschneria californica, Presl (Californian *Zauschneria*).—Onagraceæ § Epilobææ.

To the indifferent observer, there is not much resemblance between the Evening Primrose and the Fuchsia; and yet, in fact, their structure so closely corresponds, that they are ranged in the same natural family—that of Onagraceæ. The resemblance, it is true, is not so much in outward aspect, as in their internal structure, which if examined will be found to present many points of accordance. The *Zauschneria*, however, to some extent, links them together even in outward aspect;

the general habit and appearance of this plant is such as would be readily identified in general character, by a slightly practised eye, with some of the forms of *Oenothera*, and the blossoms are not unlike those of the *Fuchsia*.



It will be seen that the number four, or some multiple of four, prevails in the floral parts of all these plants; thus, the calyx has four lobes, whether it be the coloured calyx of the *fuchsia*, or the green calyx of the evening primrose; the petals also are four in either case. In some plants of the order the stamens are four, in a few instances, half four, and in the *fuchsia* and many others, twice four; the stigma is more often four-lobed, and in one species of *fuchsia* these lobes are so apparent that it has in consequence been named *tetradactyla*, or four fingered. Where this kind of structure is present, the plants are said to be tetramerous, from the Greek *tetra*, which signifies four. Among exogenous plants this tetramerous structure is not by any means so common as the pentamerous, in which the number five rules in some or all of the floral organs; while, on the other hand, among endogens the parts are usually arranged by threes.

This *Zauschneria* has been for some time known and regarded as a desideratum for our gardens. It has been lately obtained from the Californian fields, by Mr. Hartweg, the collector for the Horticultural Society of London, and proves to be, as was expected, a plant of considerable beauty, and therefore a very interesting and valuable addition to our collections. It is an herbaceous perennial,

and quite hardy if planted in a situation where it is not exposed to much damp about the roots in the winter season. Its habit is branching and bushy, and as it grows about three feet high, it forms from its size an object of some attraction, especially as the blossoms are of large size, and very numerous produced. The stems are furnished with ovate leaves, which are slightly toothed on the margin, and attached without any intermediate stalk, or, as it is called, sessile. These stems become much branched, and every one of the branches produces from the axils of all the leaves towards its apex, one blossom, which assumes a nearly horizontal position, is about an inch and a half in length, and is of a bright scarlet colour. The calyx is tubular, with a four-cleft apex, the sepals being rather narrow and sharp pointed, and the tube itself marked with four stout ribs; the corolla consists of four petals, which are universally heart-shaped, and spread out nearly or quite flat; the stamens, which are eight in number, and the stigma, which is four lobed, are all red, and project considerably beyond the corolla. It will thus be seen, that although in many respects approaching near to a *fuchsia* in appearance, it is in fact very distinct from that and all other flowers at present cultivated in our gardens, and will probably become highly prized as an ornamental species.

Mr. Hartweg found it "in fields about Santa Cruz, in California," from whence the seeds were sent, and received in England in May 1847. Sown in May, the seeds produced plants which, though of perennial duration, blossomed by the month of September. Probably when established, it will be found to produce its blossoms throughout the summer season.

The cultivation of this plant is stated in the *Journal of the Horticultural Society*, (where a sketch of the plant has afforded us an opportunity of preparing the accompanying representation) to be extremely simple. "The plant grows freely in good garden soil, and is easily increased by cuttings or seeds." A warm dry situation would be the most likely to ensure success in its cultivation.

WONDERS OF THE SEA-SHORE.*

In this work, the most extraordinary productions to be met with, thrown up from the bottom of the deep, or, produced naturally on the rocks and among the weeds of the land and water on the margin of the sea, are described: we need hardly say, that the choice

* Wonders of the Sea-Shore. London: Published by the Society for Promoting Christian Knowledge. 1847.

is good, and we believe this species of instruction, conveying to the youthful mind real facts more wonderful than fiction, is calculated to make a deep and lasting impression.

"Little does the lounger on the sands, or the loiterer on the rock, think of the numberless objects on every side of him, full of interest and beauty, which he either totally disregards, or passes by with a careless and indifferent glance.

"Those two objects near each other, the one shaped like a flattened bell-glass, of a dull crimson colour with green spots, and the other with pointed feelers, ranged like the petals of a double flower, are both the same animal, *Actinia gemmacea*, or Sea-anemone. When closed, it is in its quiescent state; when open, seeking its food.

Here, too, are living flowers,
Which, like a bud compacted,
Their purple cups contracted,
And now in open blossom spread,
Stretch, like green anthers, many a seeking head.
SOUTHEY.

"It is worthy of observation that as we approach the limits of the animal world, many of the objects bear a near resemblance to vegetables, both in the simplicity of their construction as well as in their general appearance. This holds good particularly in such animals as these, which have not only had names assigned them in accordance with this resemblance—such as that we are looking at, Sea-anemone, others Sea-marigold, &c.—but were actually classed among plants by old and less scientific naturalists. They belong to the order Carnosi (*carnosus*, fleshy, from their substance) of the Polypi family. They are extremely disagreeable to the touch, whether closed or open; in the former case they have a cold slimy feel, which is far from pleasant; in the latter the feelers appear to cause a slight irritation, arising perhaps from their roughness, as actual stinging is confined to another member of the family, *Actinia viridis*. The activity of the feelers depends probably upon the appetite of the animal, as sometimes a stick may be held within the rays without producing any effect, while at other times they close upon it immediately. They feed on shrimps, small crabs, whelks, or probably with indifference on whatever animals are brought within their reach, and whose strength or agility is insufficient to extricate them from the grasp of their numerous feelers, which can be thrown in any direction, can be greatly lengthened, are capable of being applied to every joint, and adhere by suction with considerable tenacity. Whatever is seized is conveyed to the central mouth; the soft parts are devoured, and if it be a shell-fish, the empty shell is, after a while, ejected. The size of the prey is frequently most disproportion-

tionate to the animal. 'I had once brought to me,' says Dr. Johnston,* from whom I have derived much of the information which I have given you on this animal, 'a specimen of *Actinia gemmacea*, that might have been originally two inches in diameter, and that had somehow contrived to swallow a valve of *Pecten maximus* (the scallop shell) of the size of an ordinary saucer. The shell, fixed within the stomach, was so placed as to divide it completely into two halves, so that the body, stretched tightly over, had become thin and flattened like a pancake.'

"This species is liable to great variation in colour and size. Those which are between high and low water mark, and are consequently exposed by the ebbing of the tide, are always covered with scattered wart-like appearances, generally orange-coloured with dusky blotches, coated with particles of broken shells, small gravel, and pieces of sea weed; by which means, when shut, they are not readily seen in the recesses or sandy places which they prefer. This coating adheres with great tenacity, and cannot be removed by any natural causes to which the *Actinia* is exposed; but what is surely worthy of our admiration, and seems to prove the existence of an instinct mercifully bestowed even on these lowest creatures, is, that the individuals which are placed in deep water, as if aware they did not require such a mode of concealment, form no extraneous covering, but leave the surface clean, which has then more vivid and varied tints, while at the same time the warts become smaller or disappear.

"The Abbé Diquemare, who studied the *Actinia* most carefully, says that they vary according to their contraction or expansion, presenting innumerable varieties. Their expansion is a more certain indication of fine weather than the rise of the barometer; but this cannot be practically taken advantage of except during summer, as the cold of winter drives the *Actinia* from the shore to the deeper waters, where the temperature is more equable and mild. They can leave their hold and remove to another station by gliding along like a slug, but with a slow and almost imperceptible motion, requiring, as Johnston observes, (*British Zoophytes*, p. 223,) five minutes for the distance of half an inch. This is their usual method of changing their locality: sometimes they reverse the body and use the feelers as feet; or else, filling the body with water to render it more buoyant, they detach themselves and are borne away by the random motion of the waves.

"They are very patient of injuries. They may be kept without food for upwards of a

* *British Zoophytes*, p. 224.

year; they may be immersed in water hot enough to blister their skin, or frozen into a mass of ice, and again thawed; and they may be placed within the exhausted receiver of the air-pump, without being deprived of life, or disabled from resuming their usual functions when placed in a favourable situation. A strong light incommodes the Actinia, noise startles them, they are affected by odours, and fresh water causes them to die. These various feelings originate in their great irritability, which appears to increase according to their sufferings. They are often left exposed to the air during spring tides; but in such cases they always retain a great quantity of water, which they squirt out with force when molested.

"Neither the look nor the touch of these animals recommends them as articles of food, yet Dicuquaire, speaking of this very species, says, 'Of all the kinds of Sea-anemones, I would prefer this for the table; being boiled some time in sea-water, they acquire a firm and palatable consistence, and may then be eaten with any kind of sauce. They are of an inviting (?) appearance, of a light shivering texture, and of a soft white or reddish hue; their smell is not unlike that of a warm crab or lobster.'

"They are found in every sea, some suspended from the vaults of sub-marine reefs, others covering the more exposed sides of rocks with a sort of flower-like tapestry, some confining themselves to the smooth sands, on the surface of which they spread out their tentacula, and even withdraw under the sand when danger threatens. Each species indeed selects a peculiar haunt.'

"The long flat sea-weed with curled margin, though in its younger state it is quite flat, and which with the Tangle covers the face of that rock, and the sides of this pool, is the Seabelt or Sugar Fucus, (*Laminaria saccharina*), and though little used in Europe except as manure, is very differently estimated in foreign countries.

"Thunberg informs us that this plant is prepared for the table by the Japanese, and that it is customary there, when presents are made, to lay them upon a slice of the Fucus, attached to a piece of paper folded in a curious manner, and tied with threads of gold and silver. 'This,' Barrow conjectures, 'may possibly have been intended to show in how high estimation this plant is held; being considered, perhaps, as the representative of those resources of sustenance which the sea so amply supplies to such nations as from choice or necessity may be led to avail themselves of its various productions.*' The same author

gives it as his opinion, that the Chinchou jelly of China may probably be made in part of this plant. No one, however, represents it of so much consequence as Captain Broughton;* who, speaking of the people about Endermo, says, that he always found those who lived on the opposite side of the Isthmus, open to the sea, collecting *L. saccharina*, which they dried in the sun, and made up into bundles for exportation; and that a considerable trade was carried on in this weed from Volcano Bay to Matzmai; whence it is exported to Nipon. He even mentions having seen several ships loaded with it.

"This, as well as Tangle, is used by cottagers as a weather-glass. When the weather is dry it is crisp and rigid, but at the approach of rain, the salt in the weed absorbs the moisture which is in the atmosphere, and the plant becomes moist and limp. It preserves these qualities for years. Many of the sea-weeds, but this more particularly, (hence its name of Sugar Fucus,) when dry, are covered with a white crystalline deposit, shaped like long slender needles, which, though of a sweetish taste, was long considered to be nothing more than a kind of salt. On analysing it, however, chemists have discovered it to be mannite, a sweet principle, differing indeed from cane sugar, but exactly similar to that procured from grapes. May not this substance, so different from what we might expect to meet with in the salt and briny deep,—which is contained in so many sea-plants, and so universally diffused,—be one among the many means employed to keep the vast mass of waters pure, and fit for the abode and support of its numerous and varied inhabitants? It is not for man, indeed, to fathom the wisdom of his Creator, or to account for all His works, yet an inquiry carried on with humility and reverence is not unbecoming the highest talents, and must have the effect of rendering the inquirer more sensible of the power of Him who made all things good, and dispose him to worship with more earnestness, and to obey with greater care and zeal."

The illustrations are beautiful, and altogether the work is got up worthy of the Society to which we are indebted for the production.

CULTURE OF THE WALLFLOWER.

THIS welcome spring visitant has a double claim on our respect, its powerful fragrance entitling it to a prominent place in British gardens, while its early and bright flowers add wonderfully to the charms of the spring.

* Voyage to Cochín-China, p. 313.

* Voyage of Discovery to the North Pacific Ocean, p. 272.

There are very few plants so hardy. Of the numerous varieties that have been introduced, the seedlings give us all the colours we have; and there are two very distinct classes of double, the blood colour and the gold colour. The seed may be sown on a common border or bed, and be raked in to cover it. This may be done in April. About June or July they may be planted out in nursery beds, eight or nine inches or a foot apart, and they will bloom the following spring, or even as early as February after a mild winter. From these it is very rare to obtain a double variety, and if we do, there is no chance of its being better than we have already in cultivation. The fragrance of the single wallflower is far greater than that of the double, but it is not equal in beauty, nor are the single ones worth propagating by slips or cuttings, because it is so much easier to raise them from seed; but the double kinds, which are universal favourites, are propagated from cuttings. The single, however, are much more hardy than the double, which will sometimes, but not often, live through the winter; whether it is that the seedlings are more hardy than plants raised from cuttings, we know not, but it is quite certain that the double varieties in most estimation are best grown in frames. Of the single hardy kinds, the best colours and forms are only to be procured by saving seed from the best plants, and taking great care to select them early, and have them marked, that the best flowers may not be gathered by accident instead of remaining for seed. The pods should be laid by when ripe, and the seed not be thrashed out till wanted for sowing in March, April, May, or June, according as the plants are wanted forward or late. Instead of planting out the seedlings in nursery beds, they may be planted out where they are to flower, but generally the places are occupied by something in bloom, or that will bloom before the place is wanted. However, in large borders and plantations they may as well be planted at once where they are to bloom, as have to undergo two removals, as they receive a check on the second removal, however slight that check may be if they are well taken up and replanted.

THE DOUBLE WALLFLOWERS.

These are propagated by slips, which after blooming the plant provides in abundance by shooting all over the stems. These shoots may be stripped off as soon as they are an inch and a half long, and by taking the leaves off half an inch up the stem, and sticking these into pots of good loam and dung, with a bell-glass over them, every shoot will strike and make a good plant. These struck slips may be placed in sixty-sized pots, one in a pot,

and be carefully watered, have plenty of air, all the warm showers, but be covered up from north-east winds, until their roots fill the pots, when they may be shifted to size forty-eight, and continued under the same management or treatment until these are also filled with roots, when they may be removed to pots size thirty-two, in which they will bloom strongly and well. These double varieties or species must be treated in all respects as frame plants. They will grow from the time they are first potted till they come into flower, if they are not checked for want of water or by excessive cold, and therefore they should be carefully tended, especially with regard to protection and sufficient water and shifting at the proper time.

TREATMENT AFTER BLOOMING.

The plants should be cut down after flowering into such shape as will make the new growth form a handsome plant. They may then be placed on hard ground or a shady place in the open garden, or if kept in the frame, well watered once a-day and shaded from the heat of the mid-day sun. Those plants intended to be grown for good specimens will require when they send out their shoots to have them regulated, that is, only so many left on as are required to make the plant handsome. The others should be rubbed off as soon as they appear, that all the strength may go where it is wanted. The plants that are intended to take slips from, should only be cut back to the lower end of the flower stem: the more actual stem remaining on the plant to throw out young shoots, the better, as it matters but little how small the shoots are to strike root, the only difference being that the smaller they are, the longer they are growing into strength; but if there be any difference they more readily strike root. In a general way, the growth of the wallflower from a slip is very pretty, the lateral branches coming out generally so as to bear flowers, and blooming below the main flowering spikes: the plant generally looks much more beautiful the first year than at any future season, unless great pains is taken in the mode of cutting down, and the stems allowed to grow, for unless the form be handsome the plant cannot be good.

DWARFING PLANTS FOR SHOW.

There is a plan which does not always answer, but when successful, renders the double wallflower a very beautiful object; that is, to allow the shoots to grow till July, and then to take off two inches of the top: these must be very carefully managed, for they are not so readily struck as the young shoots slipped off small. The lower leaves must be cut off, not

stripped off: the bark must not be bruised nor damaged; the cuttings must be placed an inch apart in the middle part of a pot, so that a bell-glass may be placed on and the edge of it be pressed into the soil to keep off the external air: the cuttings should then be removed in their pots to the propagating house, and be plunged into the tan so as to get a slight bottom heat. The glass should be wiped every morning inside perfectly dry, the cuttings occasionally be watered, and always shaded. When these are struck, they will not grow much more. They will require potting off in sixty-sized pots first, and they will do in them until the roots touch the side: the treatment then is the same as before re-

commended. The effect of taking the cuttings off so much later is, that the shoot having grown a great deal more, the plant has not so much growth to make, and without the bloom being a bit less, the plant is only one-third the size it would have been, or rather would be, if grown from the first stage. It is the same principle that guides us in the late striking of chrysanthemums, but the wallflower is a handsome growing plant, if taken from the first and grown as large as possible. The plants, in our opinion, are never so handsome as the first year from slips, for although they can be kept growing larger every year, they will get bare at bottom, and therefore few persons care to grow them large.

NEW FLOWERS AND PLANTS.

NAPOLEONA IMPERIALIS, *Beauvois* (Imperial *Napoleona*).—Belvisiaceæ.—A fine-looking evergreen shrub, remarkable more-over from having been selected to commemorate the celebrated Napoleon Buonaparte. It forms a shrub of about the size of a camellia, of branching habit, furnished with obovate-lanceolate leaves of somewhat leathery texture, and of a bright green colour. The flowers grow in threes in the axils of the leaves, and are much hidden by the foliage, so as not to produce any great effect; they are, however, of considerable beauty when closely examined, and are seen to be of a very interesting structure; they measure about two inches in diameter. The calyx is a thick leathery cup, divided into five ovate segments, having a perfectly valvate aestivation. Within this is placed the corolla, which consists of three distinct rings, each being monopetalous; the first ring is apricot-coloured, crimson at the base, with numerous stiff ribs, each ending in the margin in a broad tooth; by means of these ribs this part is strongly plaited; the next ring is small and thin, stationed at the foot of the first, and is cut into an indefinite number of narrow sharp-pointed yellowish segments; the inner ring is membranous, erect, assuming the form of a cup, the edge cut into many fine segments, and turned down, so that this part is not at all conspicuous; the stamens form another cup within the corolla, and next to them comes a deep fleshy cup, or disk, standing as high as the stigma, and having ten sides; the style is five-angled, terminated by a pentagonal table-shaped stigma. The flowers, when decaying, assume a bluish tint. Native of Africa, from Senegambia to Owere. Introduced in 1843. Flowers in May. It is also called *N. Heudelottii* (Adr. de Jussieu). *Culture*.—Requires a stove; loam, peat, and sand; propagated by cuttings, planted in sand, and

placed under bell glasses in a gentle bottom heat.

ARISÆMA MURRAYI, *Hooker* (Dr. Murray's *Arisæma*).—Aracææ.—A rather interesting herbaceous plant, with tubers about the size of small potatoes. The flowers precede the foliage. The scape is a foot or more long, round, of a purplish tint, sheathed below, and terminated above by a delicate and handsome spathe, the lower half of which is green, and convolute into a tube, the upper half white with a red ring around the mouth, ovate, convex, almost cucullate, and inclined over the mouth; within the tube is the spadix, which is subulate, and shorter than the entire spathe, the upper half naked, and the lower covered with flowers. The leaves, which grow up after the flowers, are supported by long round petioles, and are peltate, and deeply cut into five or six ovate-lanceolate acuminate segments. Native of the East Indies, "in the valleys of the Bandsda hills, to the south-west of Surat." Introduced in 1845 to the Royal Garden, Kew, by Mr. Law of Tanna. It is the *Arum Murrayi* (Graham). *Culture*.—Requires a stove; turfy loamy soil; propagated by dividing the tubers.

LITHOSPERMUM CANESCENS, *Lehmann* (hoary Gromwell).—Boraginacææ § Anchusidæ.—A handsome perennial, with a long woody root abounding in crimson dye, and producing several erect, almost simple hairy stems a span or more long. The leaves are alternate, erecto-patent, oblong-lanceolate, obtuse at the apex, attached directly by the base, and having a hoary surface from being clothed with closely-pressed whitish hairs. The flowers grow in leafy secund racemes from the tops of the stems, and are of a bright orange or golden colour, and of large size as compared with the stature of the plant and that of the blooms of allied species. Native of North America, "from Canada and the Sas-

katchawan in the north, to Carolina in the south." Introduced in 1847, by E. Leeds, Esq. of Manchester. Flowers from May to July. It also bears the names of *Lithospermum conspicuum* (Sprengel); *Batschia canescens* (Michaux); and *B. conspicua* (Richard). *Culture*.—Hardy; light sandy soil; propagated by seeds, or by division of the plant.

EPISCIA BICOLOR, *Hooker* (two-coloured *Episcia*).—Gesneraceæ § Gesnerææ.—A very pretty dwarf herbaceous perennial, somewhat creeping, and procumbent, with very short hairy stems. The leaves are large, between ovate and cordate, hairy, somewhat glossy, with coarse serratures along the margin. The flowers are very numerous from the axils of the leaves, and are erect or a little inclined, the corollas consisting of a short white tube, gibbous on one side at the base, dilated above, tumid beneath, within spotted with purple; the limb rather large, nearly equal, deeply divided into five rounded lobes, white, with a broad purple border. Native of New Grenada. Introduced about 1847, by Mr. Purdie, to the Royal Garden, Kew. Flowers in summer for several weeks in succession. *Culture*.—Requires a stove; light loam and leaf-mould; propagated by division or by cuttings.

BURTONIA PULCHELLA, *Meisner* (beautiful *Burtonia*).—Leguminosæ § Papilionosæ—Pultenææ.—A beautiful and graceful shrub, with slender glabrous branches, slightly downy when young. These branches are rather thickly clothed with sessile trifoliate leaves, the leaflets of which are narrow, linear, with revolute margins, and obtuse at the apex, with a curved mucro. The flowers proceed from the axils of the upper leaves, and are so copious there that they conceal the leaves, and appear to grow in short leafy spikes; they are large and very beautiful, the vexillum broad, rich purple, with a yellow spot at the base, the alæ and carina deep puce-colour. Native of the Swan River colony. Introduced by Messrs. Lucombe, Pince, and Co. of Exeter, about 1846. Flowers in spring and summer. *Culture*.—Requires a greenhouse; sandy peat with a little loam; propagated by seeds, or by cuttings planted in sand beneath bell glasses.

MITRARIA COCCINEA, *Cavanilles* (scarlet-flowered *Mitraria*).—Gesneraceæ § Gesnerææ.—A distinct looking, and very ornamental shrubby plant of scandent habit, growing three or four feet in height, the branches clothed with small opposite ovate-acute serrated leaves. The flowers grow from the axils, solitary, on long slender peduncles, by which they hang dependent; they are of a bright scarlet colour, with a ventricose tube an inch and a half long, somewhat bilabiate, divided into five rounded lobes, the two forming the upper lip being larger than the other three. The foli-

age of the plant is neat, and the flowers numerous and showy. Native of the Island of Chiloe. Introduced by Messrs. Veitch of Exeter, in 1847. Flowers in the summer months. *Culture*.—Probably hardy, well adapted for a conservative wall, or for a cool greenhouse or conservatory; rich light loamy soil; propagated by cuttings of the half-ripened wood planted in pots of sand under a handglass.

SIPHOCAMPYLUS NITIDUS, *Pohl* (shining-leaved *Siphocampylus*).—Lobeliaceæ § Lobelææ.—A very neat and pretty shrub of remarkably dwarf and compact habit, growing scarcely more than eight or ten inches high, and furnished with numerous small obovate deep green shining leaves, which are sharply serrated on the margin, and on the surface deeply reticulated with veins. The flowers are small, but produced in considerable abundance over the plants; they are tubular, bright scarlet, and five cleft and yellow at the apex. Native of Brazil. Introduced about 1846. Flowers throughout the summer months. *Culture*.—Requires a stove; turfy peat; loam with sand; propagated by cuttings planted in sand, and placed in a gentle heat.

CAPSICUM, CHILIES, AND PEPPER.

THIS remarkably hot family, so useful in pickles, and so readily converted into an excellent substitute for the foreign Cayenne pepper, should be grown by every family where there is a sufficient consumption to make it worth while; for the culture is simple, and requires but ordinary attention. In February make up a hot-bed as if for cucumbers; sow the seeds in pots and place them in the bed; as soon as they are up, water them to give them a little moisture. Keep them clear of weeds, and give air by tilting the light at the back part. As soon as they have four leaves beside the seed-leaves, pot them off, one in a pot, size sixty; level the soil of the hot-bed, and set these pots close together all over it; water freely all over the top of the foliage, shut them up a few hours, then give them air from behind. As the roots establish themselves, and the plants begin to grow, give more air, and as soon as the roots protrude through the bottom of the pots, let them be changed to those sized forty-eight. The soil in which these things are generally grown is loam, and peat, and decomposed dung, in equal parts; but the object is not to grow them large and rank for private use, and therefore half turfy peat, and half loam from rotted turves, form the best compost. Let one-third of the pot be filled with crocks for drainage, and when the plants are shifted,

shake out the old crocks, and part off the earth, but do not bruise the fibres ; put a little earth upon the crocks rather heaped up like a cone in the middle ; spread the roots a little all round, and fill up with the compost, taking care that the collar of the root be placed at the exact surface of the soil as it was before ; water, to settle the earth about the roots, and replace the handsomest of the plants, which are those the most dwarf and bushy, into the frame, so that it is filled, and all those that are over after filling, may be placed in the greenhouses. When the shifted plants have fairly begun growing again, get ready a small greenhouse which has its proper means of heating, and place all the plants therein, keeping the temperature up to sixty of a night, and seventy in the day. At the least appearance of the aphides or green fly, procure a pair of fumigating bellows, and, with a quantity of tobacco, fill the house with smoke so completely, that the plants shall be completely enveloped in it, taking care to close every window, door, and opening, so as to keep in the smoke all night. In the morning examine to see if any of the flies are alive. If any number of them remain alive, the smoke has not been given in sufficient quantity to fill the house. Tobacco smoke, like all other, ascends to the roof, and continues to go up as high as it can, so that the smoke has to be continually supplied until it reaches down nearly to the ground. A fumigating pair of bellows enables you to blow the smoke through a hole made in the door or window to receive the nozzle of them, and you may see through the glass when the house is filled ; but as many have not these bellows, there is another way : get a good sized pot with side draining-holes, (many of the sixteen size have them,) enlarge one of these holes so as to take in the nozzle of a common pair of bellows ; into the bottom of this pot put a handful of lighted charcoal, and on this place the quantity of tobacco supposed to be enough to fumigate the house. You may blow this occasionally to keep up the burning and the supply of smoke, which will form in clouds above your head, and continue to superintend till the smoke is below your head, then sit down, or kneel down, to keep your mouth below it ; and having previously contrived that there shall be a hole in the door, or somewhere near the bottom, place the pot as close as possible to it, make good your retreat, and apply the bellows to it to complete the filling. In the morning, syringe all the plants with a syringe and fine rose, so that the streams of water shall be very minute, but may nevertheless be applied with a little force, and it will wash off the dead ones, and the few stragglers that may have escaped ; wash out the shelves

and floors of the house at the same time, and shut up the house all but a little bit at the top to let out the steam. The plants may be topped as soon as they are in flower, and have begun to set their fruit, because ten or a dozen are quite enough for a plant of the Capsicum tribe, and three or four dozen quite enough of the Chilies and smaller pepper ; so, when there are so many in a fair way of growing, the tops may be taken off, like the tops of beans, to promote the setting of the rest. The heat must be kept up to the temperature we have mentioned ; and in the violent heat of the day more air must be given, and great attention must be paid throughout to the watering. The fruit may be gathered for use from time to time while green, as well as when ripe ; but the best way to gather for use while green, is to take half-grown ones, never to take the forwardest, because they are the best to leave for ripening ; nor ought they all to be taken from the same plants, it is better to thin all in their turn than to strip a few. When the fruit is ripe, which is when it has arrived at a fine scarlet or blood colour, it may be gathered and laid on cloth or paper to dry in the sun ; when perfectly dry, they may be kept almost any time. They make an excellent addition to pickles, and they are an essential ingredient in all hot pickles. The Chilies, which are in fact a small kind of Capsicum to all appearance, are used for the purpose of giving ordinary vinegar a large degree of heat by merely soaking a number in the liquid, to which they impart all their peppery nature. The vinegar thus prepared is called Chili vinegar. The fruit of the Capsicum, when perfectly dried, may be ground or rubbed to powder, and forms an excellent substitute for the Cayenne pepper of commerce. The plant is an annual, so that when the fruit is gathered the shrub is done with, and may be thrown away.

THE INFLUENCES OF HORTICULTURE, OR VEGETABLE LIFE.

THE term horticulture is here used in its widest sense as embracing the whole garden of creation, and may, in this instance, be reckoned as identical with the economy of vegetation. What has the influence of this vegetation been since the world began, not in the arts and manufactures, but mentally and *spiritually* considered ? What teacher has instilled into the human mind better lessons of peace and contentment, love and adoration ?

These questions shall be answered at length ; but, before commencing to trace the worship which this vegetable life has exacted from mankind in all ages, it is worth while to

allude, for a moment, to a sectional point, in which it appears to have failed to command its wonted homage. This allusion will appear the more necessary, when it is considered that it involves a great question connected with sanitary reform. When men die in England, they are buried in churches or churchyards, in the heart of towns and cities, where no quiet is, and where Nature's voice is not heard, nor her green garb unfolded: they are not laid beside the willow or cypress. Outside the city, are sunniness, shelter, and repose—objects on which almost every one dwells with pleasure. For example, in yonder sweet upland is an oak; it stands there, a magnificent tabernacle which the Almighty hath spread—spread specially for man. Now, there are few indeed but can trace some glimpses of the glory of God in that tree; and there are not many whose minds could not be attuned to listen with pleasure to the song of that oak as the winds come, or even to the shoutings of the tempest in its lofty top. But would they make their grave with it? Not they. Would it be at all a pleasing adjunct to their last earthly resting-place? Not it. Take a softer scene—roses, birches, willows, the beautiful greensward, the song of the robin, the pure and balmy air of heaven—would there be any inducement? "Well, no; our relations lie in the church, and we should like to be placed in the same grave with them." Why this dislike to lie down with Nature? A truthful answer, it is to be feared, would suggest the fact, that the English, in this respect, are essentially unpoetical. By a reference to the earliest biblical times, it is evident that mankind were in this respect actuated by a much better feeling. Their great anxiety was, whatever might be their lot in life, to be with nature at death; a feeling equally honourable to themselves, and well-pleasing to the Creator of those adornments which had so captivated their fancy. At the same time, though it is a reproach to England to be so late in adopting a refined taste in the choice of her burying places, it is unquestionable that a desire for out-of-door interments, even in this country, is on the increase; and that the hues of vegetation, the whisperings of Nature throughout that domain, and the repose which pervades the well-chosen cemetery, will ultimately prevail over prejudice and custom.

Let us turn, however, to the influences which vegetation has wrought generally, and we shall find that its course has been triumphant. Its first teachings were given to religion—a cause which it has enforced and aided up to the present time; not that our holy faith requires any extraneous support whatever, but simply because it seemed good

to the Author of Nature and Religion that the former should be used in enforcing the precepts of the latter. The examples in the Bible are exceedingly appropriate and beautiful: thus, in order to give some faint idea of the happy change produced by the gospel, the prophet Isaiah says, "the desert shall rejoice and blossom as the rose." Again, the graces of the Church are represented by Solomon as a "heap of wheat set about with lilies." Are the dispositions of men to be changed? Then this change is represented by a striking figure from our sylvia: "instead of the thorn shall come up the fir-tree, and instead of the briar shall come up the myrtle-tree." Are any waiting for a reward on their closing with the offers of the Gospel? Then of such it is said: "they shall sit every man under his vine and under his fig-tree, none making him afraid." What stage of prosperity may the Christian reach unto? Abounding in all good works, clad with the beauties of holiness, and soaring upward in heavenly-mindedness, he is appropriately represented to "flourish like the palm-tree, and to grow like a cedar in Lebanon." On the other hand, is he for a season beset with darkness and disappointments? His resolution, notwithstanding, is firm: "although the fig-tree shall not blossom, yet I will rejoice in the Lord, I will joy in the God of my salvation."

No subject causes more apprehension and dread to mankind than that of death. To all, he is the king of terrors; yet a reference to vegetation, calmly and considerably made, allays much of this fear and uneasiness. The sign of our dying is before us every November—in the woods and groves, and in our gardens; and what is the amount? A mere shuffling off of the sere and faded vestments, that there may be a resurrection to life and beauty in the spring-time.

Let us look at this promised resurrection of the flesh. The Sadducee doubted it, and, in order to confute him, aid and evidence were instantly brought from the vegetable kingdom: "Thou fool! that which thou sowest, thou sowest not that body that shall be, but bare grain, it may chance of wheat or of some other grain; but God giveth it a body as it pleaseth him, and to every seed his own body. . . . So also is the resurrection of the dead." But the figures taken from vegetation do not end here, they enter into heaven; and hence it is said that every Christian, at the close of his labours, shall have a right to the "tree of life."

Poetry must not be forgotten. It has had a tongue in trees, silvery, hoarse, harmonious, all through time. Look at the old Greek beside his umbrageous and odoriferous upland; he has not a spark of the worldling in him, for

those tenderest of sylvan associations he is now weaving for the classic page, are as a sealed book to the man of business. But it is not necessary to leave England in search of that current of holy feeling engendered by vegetation. The offerings made to God in this line of thought, by our English poets, have been exquisitely devotional, and there is no risk in asserting that such tributes find a ready acceptance at heaven's gate. To give examples would be to transcribe a great portion of our English literature; and at any rate the subject, in all its bearings, deserves full consideration in a separate article. It is sufficient, at present, to note that all our poets breathe the breath either of the floral or sylvan life; and that in their pages we discover the hues, the odours, the outlines—it may be the song—of one or other of the objects which adorn the brow of vegetation. Nay, further, an attentive reader will discover that our poets have had particular favourites amongst trees and flowers. Herrick is all over hawthorn blossoms bespangled with dew. Phillips and Thomson go together in praise of the “lusty-handed year,” and we inhale from their pages the odour of apples. Milton, when not engaged with his martial heroes, is twining either the eglantine or vine about “the marriageable arms” of the elm. If Southey had any preference, it was for the ash, “grey as the stone to which it clung.” Moore's fancy in this respect is difficult to trace; butterfly-like, he visits all, and perhaps his love rests on the violet and almond. Our own Wordsworth declares for the oak and Highland pine (*Pinus sylvestris horizontalis*). Addressing the writer of these pages lately, he says, “Now that we are on the subject of trees, I may mention, what I have very likely told you in some of my previous letters, that I prefer the Highland pine to all other trees, except the oak, taking into consideration its beauty in winter, and by moonlight, and in the evening.” In Tennyson's lines we have the rustling, dry and solitary, of the fen-reed. Burns adopted the birch; and so long as the “banks and braes o' bonny Doun” form a part of nature, that tree will be thought of in connexion with its gifted admirer.

The repose of mind which is in the gift of horticulture must obviously be alluded to here. Bacon, Newton, Evelyn, Grindal, Sir Thomas Cecil, Raleigh, Burleigh, Compton, and others, are well-known examples. Mental quietude they could find nowhere else; and as with them, so it is with the world in general. Where do we seek for the smoothest brow? And in what class do we find the pressure of misery whitening the temples most? The answers are obvious. There are three other names which should have been added to the

foregoing, as illustrative of our position,—Walpole, Windham, and Buxton; all distinguished by intense love for planting and rural retirement. Hear the first:—

“To the Rev. Mr. Milling.

“Wolterton, Norfolk, May 29, 1745.

“DEAR SIR,—I am really ashamed of having neglected so long to return you and my good old friend, who remembers me so kindly and so often, my grateful thanks for your generous sympathy with me in the affliction I felt from the death of my dear brother, the late Lord Orford. This heavy stroke made so deep an impression upon my heart, that for a long time I could do nothing but lament my own loss. . . . As to politics, I can only tell you, that my thoughts, as well as my situation, are at a great distance from them, and my *res rustica* employs me entirely. Retired from the noise and nonsense of a public station, no man, I thank God, can have more reason than I have to be satisfied with the more solid and innocent pleasures of a private life. In this situation my mind is kept in a pleasing activity, very different from that which arises from the tumults of passions and the hurry of affairs. My house, of my own building, is not extremely large, nor little; is neither to be envied nor despised. . . . It is encompassed with a most delightful and innocent army of vegetable striplings, of my own raising, which are already (though but of twenty years' growth from the seed), with a becoming rivalry, stretching and swelling themselves into timber. They are all of noble and worthy extraction; the names of their families are oaks, Spanish chestnuts, and beech; and I believe none of their relations in any country can be more hopeful and promising than they are.

“Before my house, on the south, a green carpet of the finest verdure gratifies the eye, and gradually leads it into a more extensive plain. On one side a lake of living water catches and fills the sight, from whence a most beautiful fluid glides with a serpentine and seemingly endless current, and loses itself in a wood on the other. My rural walks and contemplations amidst this mild, diversified, and engaging scene, afford me constantly new sources of health and pleasure, and make me lament the noisy, anxious, and tumultuous hours spent amidst the broils of faction, or vain attempts to serve an ungrateful public.”

Windham, again, relieved from the cares and anxieties of office, retires to Felbrigg, and almost worships his hawthorns, which, in his eyes, were the most beautiful of all our shrub-flowers. The great statesman and orator now rests amidst them.

A great fight with slavery, and Buxton seeks to be with nature. Planting was his last occupation ; and how that work was done may be now seen in the thriving woodlands

stretched along the sides of the German Ocean at Runtun and Trimmingham. He, too, sleeps amidst those scenes which he helped so well to embellish.

PRACTICAL HINTS AND ORIGINAL NOTES.

CHANGES OF WEATHER INDICATED BY ANIMALS.—The common house spider, on the approach of fine weather, puts out its head and stretches its legs out of its hole ; and this the farther, the longer the fine weather will continue. Against bad weather it retires farther back, and before more tempestuous weather it turns quite round, showing nothing but its hinder parts to the observer ; thus acquainting him with the approaching storm. At the commencement of fine weather, the web with which it surrounds its corner is but of moderate extent ; if the fine weather is to be lasting it enlarges it two or three inches ; and if it do this several times consecutively, we may be certain that the weather will continue fine for some time. In winter they are as certain prognosticators of approaching cold. If frost and snow be coming on, they either seize upon webs already made, in which case obstinate battles often ensue, or they make new ones, and labour diligently at them.

If animals show signs of fear and uneasiness while the weather is very calm and close, it is almost certain that a storm will ensue. Rain may be foretold from the actions of various animals, as follows. When birds are seen more employed than usual in searching among their feathers for insects, which, on account of the *unusual currents of electricity* in the atmosphere, torment them. When sea-gulls, and other aquatic fowls, particularly geese, make a greater noise than usual. When swallows fly low and seem to skim the surface of the earth. When pigeons return to the pigeon-house before accustomed time. When certain fish, such as porpoise, sport at the surface of the water. When bees do not quit their hives, or fly only to a short distance. When sheep bound in an extraordinary manner, and push each other with their heads. When asses shake their ears, or are very much stung by flies. When flies and gnats sting more severely and are more troublesome than usual. When a great number of worms issue from the earth. When frogs croak more than usual. When cats rub their heads with their fore-paws, and lick the rest of their bodies with their tongues. When foxes and wolves howl violently. When ants quit their labour and conceal themselves in the earth. When oxen, lying together, frequently raise their heads, and lick each other's muzzles. When cocks crow before their usual hour. When domestic fowls flock together and squeeze themselves

into the dust. When toads are heard crying in elevated places.—*Glenny's Almanac.*

THE TREMELLA.—The tremella is a gelatinous green plant, which forms itself in stagnant water. It consists of a number of filaments interwoven through each other, which, when considered singly, are composed of small parts about the tenth of an inch in length, united by joints. This natural production, when viewed with the naked eye, exhibits nothing remarkable or uncommon ; but, by microscopic observations, two very extraordinary properties have been discovered in it. One is the spontaneous motion with which these filaments are endowed. If a single one, sufficiently moistened, be placed on the object-plate of the microscope, its extremities will be seen to rise and fall alternately, and to move sometimes to the right, and sometimes to the left. At the same time, it twists itself in various directions, and without receiving any external impression. Sometimes, instead of appearing extended like a straight line, it forms itself into an oval or irregular curve. If two of them are placed side by side, they become twisted and twined together, and by a sort of imperceptible motion, the one from one side, and the other from the other. This motion has been estimated to be about the four-thousandth part of an inch per minute. The other property of this plant is, that it dies and revives several times ; for if several filaments, or a mass of tremella, be dried, it entirely loses the faculty above mentioned : it will remain several months in that state of death or sleep ; but when immersed in the necessary moisture, it revives, recovers its power of motion, and multiplies as usual. In consequence of these facts, some philosophers have not hesitated to class the tremella among the zoophytes, and consider it as the link which connects the vegetable with the animal kingdom, or the animal with the vegetable ; in a word, as an animal or vegetable endowed with the singular property of being able to die and revive alternately. But is this a real death, or only a kind of sleep, a suspension of all the faculties in which the life of the plant consists ? To answer this question, it would be necessary to know exactly *what is the nature of death.*—*Glenny's Almanac.*

REDUCING THE SELECT LISTS OF FLOWERS.—As flowers become more perfect, the collections of the best florists will become more circumscribed ; and whereas we once had in the

most select lists annually published in the almanac thirty or forty flowers, we shall now have a much smaller number. The reason is this. In the first instance, when the catalogues contained several hundred, three-fourths of which were really useless to all florists of taste, it was no small task to reduce them to three or four dozen; but it may appear strange that we are able to reduce the number as better flowers come out; however, the reason is plain. At first it was difficult to pick out a dozen good flowers; six or seven might be found very superior to the rest; and then we came to a class of flowers of which there were many of equal claims. Perhaps after the first half-dozen there might be several dozen very inferior, but whose claims were equal; it was impossible, under such circumstances, to select, and therefore the whole were necessarily taken, or none. But as a dozen or a dozen and a half were far better, if there could be found such deserving a preference, it is clear that as soon as new ones of a superior quality could be had to make up the dozen, or dozen and a half, all the secondary ones taken in at first could be omitted, and a list containing only superior ones continued. However lightly the early lists may have been looked upon, they were of immense use to amateurs and young beginners. If we wrote to any of the trade for catalogues, we were favoured with a list of some hundred, when we required but two or three dozen at the most; not the least guide to the quality could be found in any of them. The price never indicates the quality; that only represents the scarcity, or the novelty, or the small quantity the dealer has in his own stock. It was no small benefit to the buyer to be able to refer to select lists of not more than three or four dozen of the best among the hundred. Still more beneficial will be found lists reduced to a third of the number, and comprising the best of the modern flowers. In the first list of pansies there were many very imperfect, many very uncertain. One of the great faults that prevailed was that condemning defect, the eye breaking through to the border; all that could be said of these was, that although they had been seen without the blemish, and are still occasionally shown without it, they are defective nine times out of ten, and only waited for better ones to be excluded altogether. The pansy has been industriously raised within the last few seasons, and some excellent additions have been made; these will displace very many of the varieties that were admitted at first only because there were no better to put in. The most deficient of all the floral lists, that of the roses, was, perhaps, the most conspicuous; and nothing has been yet done to set us right in that flower. Descriptive cata-

logues, by dealers, there are in plenty, containing many hundred varieties, but we need not hesitate in saying that the descriptions in the trade lists are shamefully deceiving. Many are called show flowers that have not one good property; and, strange as it may appear, the more people are deceived, the more they seem to encourage the dealers who deceive them. We do not attribute to rose dealers intentional deception; they are, for the most part, sorry judges of flowers, and are as pleased with a miserably rough flower, with its flimsy petals, that open to-day and go to pieces before night, as they are with a flower which retains its beauty for days, and has petals that seem to defy the wind and weather. We judge so, because we see the flimsy varieties we speak of praised in the catalogues as "first-rate kinds," "excellent show flowers," "splendid varieties," and so forth; and very much better ones passed over without half so much fuss, and without any laudatory recommendations. We hope to see some good list of about three dozen of the best roses, for all beyond this is no credit to a garden; or perhaps we might have some regard to the season of blooming, and ask for about a dozen of the China or smooth-stemmed kinds, that seem to be always growing and blooming; a dozen of the summer roses, such as the old cabbage, Provence, moss, and so forth; a dozen perpetuals, and a dozen autumn-flowering; beyond this we should not trouble ourselves; for when we look at the collections of an exhibition, it is with the greatest difficulty we can select a dozen that deserve a place in a well-kept garden.

THE NECESSITY OF ATTENDING TO ALL SEED-LING CROPS.—Nearly all our new vegetables, and many other new and good subjects, have been discovered by accident. How many more, then, may have escaped than have been noticed? Acres of peas, cabbages, and other subjects, have been sown, planted, cut, and marketed, without so much as a single inquiring inspection as to their claims to notice on account of novelty. Probably some of the finest and most valuable improvements might have been discovered, had they been inspected at those critical periods which show off their qualities to the best advantage. But large growers look only to the general complexion of fields and large plots; they look to the general bloom, the general condition, and judge by the bulk as to the season for marketing. Probably, had the peas been examined at the proper time, there might have been one in flower a fortnight before the rest. Perhaps, if generally examined when in pod, before gathering, there might have been some as large again, or as long again, or half the height, or double the height of the rest, sufficiently distinct to be worth notice and mark-

ing, and growing separately another season. Perhaps among cabbages there might have been one more hearted, and ready for market a fortnight before the rest; a larger, or smaller, or in some way distinct from the rest—for this has been the way new things have been found; but as they have been found without looking for, many of more importance may have been lost, because they were not seen, and went to market among the rest. When we consider the value of a new and good subject, we think it would pay any grower to pay a visit of discovery; not that he need go up and down every row of peas and cabbages, but he might go up and down every twentieth row, and cast his eyes right and left, to see if any one subject differed materially from the rest; to observe if colour, form, habit, or other striking difference distinguished any plant within sight; and if so, to mark it with a bush, or stick, or a tie of some kind, that it may be left standing when the rest are gone. In all the cabbage tribe this is very important, because the whole family is apt to sport; and it is these sports that have produced us so many excellent varieties, from the common ragged jack to the finest Brussels sprouts. Besides, there are so many good points wanting. Hardiness in the brocoli tribe and the cauliflower—earliness, lateness, size, flavour, beauty, colour,—in short, there is no end or limit to the varieties there is room for in the Brassica family; and much of which that is desirable may have existed and been overlooked, and lost again, all for want of timely inspection. Those who set to work to obtain new varieties by crossing, are quite out of this range of observation; it does not apply to them, for they look anxiously enough for the result of their labours; but many a really great improvement might have been discovered in the midst of things grown in the ordinary way; and without any such motive, we know that a pea has been accidentally seen in a field of many acres with a flower larger or smaller, or earlier or later, than the rest; that it has been marked, found different, perhaps better, perhaps worse, than the rest, but at all events different; it has been marked, and all the produce saved and sown by itself. It has proved better, has been named, highly spoken of, and sold out at a large price; and but for an accident it would have shared the fate of the rest, been picked and marketed green, been eaten and destroyed. It is impossible to say what may not have been attained had all that has been raised new been saved, instead of going as the rest have gone, and never been heard of. We hope there will be a little more attention paid by market gardeners, for they are as much interested as any body, and have more opportunities than any other class of men.

THE DESTRUCTION OF BOTANICAL DISTINCTIONS.—Florists have always been at war with botanists; and there was a time when botanists openly lectured against the crosses bred by florists, because they tended to confuse the species; and scarcely was a plant noticed by the different botanical works, than the florists seized upon it as fair game, and either produced double flowers, or new varieties of very distinct character, so that the original species was lost or confounded in a phalanx of improved kinds far more distinct from each other than the species which had engaged the attention of botanists and artists to show off their distinctive characters. This evil existed of old. The florists were ridiculed for their want of taste and their opposition to science. Their best varieties were called monsters, and the lovers of all the deformities of nature were entertained, from time to time, with pictures and descriptions of plants, in comparison with which our wild flowers and weeds were handsome. When the Dahlia was introduced in its wild state, there were several seedling varieties brought from Mexico, but they were ushered forth with all the pomp of distinct species. The florists no sooner took in hand the cultivation of the plant than they produced hundreds of varieties, far more distinct from all the species, and from each other, than any two of the subjects so scientifically announced to the world. Let us turn back to the olden times: nay, up to a late period, the botanists stuck to their mis-called *species*, so we need not go very far. In Paxton's Botanical Dictionary, edited by him and Dr. Lindley, we find the following:—

Dahlia <i>Cervantesii</i>	Scarlet, from Mexico.
Ditto <i>Crocata</i>	Scarlet, ditto.
Ditto <i>Frustranea</i>	Scarlet, ditto.
Ditto <i>Frustranea Aurantia</i>	Orange, ditto.
Ditto <i>Frustranea Crocea</i>	Yellow, ditto.
Ditto <i>Frustranea Lutea</i>	Sulphur, ditto.
Ditto <i>Superflua</i>	Purple, ditto.

And in a sort of appendix to the work, for omissions and subsequent arrivals or discoveries, we have—

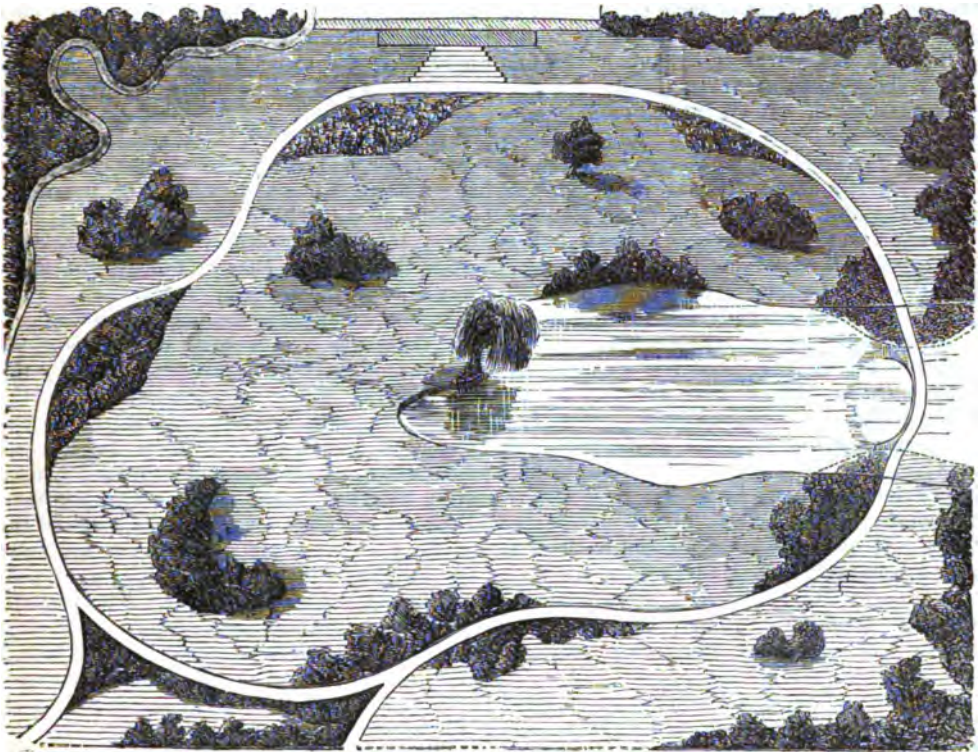
Dahlia <i>Barkeriae</i>	Blush.
Ditto <i>Excelsa Anemonæflora</i>	Light, from Mexico.
Ditto <i>Glabrata</i>	Lilac, ditto.
Ditto <i>Scapigera</i>	White, ditto.

We are not going to criticise the dictionary, or we might be inclined to condemn an authority that gives us the Dahlia as a hardy plant, when it is well known that we have not a more tender thing in British gardens. True, they do allow that *Excelsa Anemonæflora* is a greenhouse species, although it is the only one that is not pronounced hardy, and is well known to be quite as hardy as the rest. However, as we before observed, our object is not to criticise the dictionary, but the idea

of calling all the above distinct species, while there is not the slightest distinction in any one of them that may not be found in any batch of seedlings saved from common flowers, any year within the last forty years. The *Anemone* flora, and, indeed, all the misshapen things that were as useless as the original varieties, have long been banished from the florist's gardens; but it is not too much to say that five hundred, if not five thousand varieties, far more distinct from each other than the varieties originally dignified as species, have been raised and cultivated, when it was the fashion to have large collections. The model of the flower is, however, becoming so splendid, and the taste of the public so improved, that few florists, even among those in trade, grow more than a hundred, and those quite the best.

THE SUNFLOWER. — Among the old-fashioned subjects that seem pretty well banished from modern gardens, the Sunflower may be placed; yet the value of that plant is scarcely known. It is true that the same qualities are possessed by other plants, and this, in a great measure, prevents the development of the properties which belong to the subject of our notice; but they ought not to be lost sight of, for there may be circumstances under which its whole value may be appreciated. Let us consider first, then, the uses to which the plant and its parts may be applied. First, then, it yields abundance of seed, which is equal to any, if not superior to most food for poultry. Secondly, the seed yields abundance of oil, and the oil-cake is food for cattle. Third, the plant is full of very strong fibre, capable of being worked into coarse materials cheaper than any other fibre we are acquainted with. These points are well worth the consideration of emigrants, who should on no account neglect to take seed with them, for they are likely to grow well under circumstances unfavourable to many other plants. It is one of those subjects which will grow any where, and produce a crop. There may be differences between light and heavy crops, according to the culture, but there will always be a crop, even on land that would bring nothing else in; at any rate, very little else. To grow sunflowers in perfection, sow thinly all over the surface in the middle of April, in a bed four feet wide, and as long as you require, according to the quantity of seedlings you wish to plant out. Sow thinly, and if the weather be dry, water it even before it is up. It will soon be above ground, and if there are any so close together as to prevent them from growing well, thin them in those parts; but as they are all to be planted out as soon as they have got four rough leaves, they are not to be thinned much, except where the seed

has been huddled together by accident. They must be weeded as soon as they are up, and kept clear of weeds until they have grown strong enough to plant out. If a showery time comes, you may, for the sake of the great advantage of wet ground, plant out smaller than we should propose as a general rule; and so, instead of waiting for four rough leaves, plant them out with only two. On the other hand, we would wait till the last day if there were any prospect of rain, rather than plant out in dry weather. Let the ground be dug or ploughed, and harrowed, ready for planting out, and plant them out in rows three feet from each other, and the plants two feet apart in the rows. Let them be dibbled in the same as cabbage-plants, except that they must not be put in deep. If they are planted on a large scale, it is as well to plough a furrow every three feet, and plant at the bottom of this furrow; and unless it be wet weather, they must be watered in; but this labour can be got rid of by planting in rainy weather. In about a month, when they have become established, and the weeds have grown up pretty thickly, the crop must be well cleared. After this, the plants will overpower the weeds, and they will want no more care till nearly in flower, when five or six of the best advancing buds may be selected, and the buds at the ends of all the other branches may be pulled off. This has the effect of driving all the strength of the plant into a few heads of bloom, and sending all into flower at one time, otherwise the sunflower will begin with the crown bloom, and contain a succession of lateral flowers for months, so that one-half never ripen the seeds, and the early ones are weakened by the constant opening of the side blooms. There is not a single crop so inviting to small birds; as soon, therefore, as the seeds ripen, there must be a continual watchfulness: people sent round with baskets to gather the seeds as they ripen, and boys employed to drive away birds as the harvest approaches. The heads are not to remain on the tree until the seeds are all black, but as soon as the seeds are full-grown, and the outside ones are turned back, say two-thirds towards the centre, they are fit to gather. They should be placed in the sun upon cloths and perfectly dried, when they fall out of themselves; at all events, children may be employed to rub them out, and they are as easily cleared as any seed that is grown. With regard to the plants, they may be treated as hemp and flax for the purpose of using the fibre, or may be burned on the ground after drying, that their ashes may be spread; but the seed alone, whether used for its oil and cake, or as food for cattle, pigs, and poultry, will repay well the cost and trouble of cultivation.



IMPROVEMENT OF GARDENS, PARKS, AND ESTATES.

THE state of many noble establishments is a reproach to the owners, not less for the bad example it sets to those less wealthy, than for the lost opportunity of doing good by employing labourers who want work. But those who have entertained an idea of setting their grounds in order, have often been deterred by the frightful cost which in some hands they would incur. Let a professional landscape gardener be called in, and you will find in general you have to surrender yourself and your house into his keeping; to put up with his whims and fancies; to incur the cost of destroying all that is offensive in his eyes, though perhaps not so to the mass, that he may lay out the grounds anew after a plan of his own; and he cannot or will not tell you, within even a few hundreds of pounds, what will be the extent of the expenses. Now this naturally prevents even rich men from improving their estates; and unless they consult a practical man, who knows how to restore all the good that has gone, and avail himself of any thing there is on the spot, in his proposed arrangements, they had better let it alone, as nearly everybody does, than begin alterations. A few rules on this head may be written down, and we think applied with some advantage by almost every nobleman and gentleman in the country.

Trees of some years standing ought to be respected as fixtures, not to be removed for any trifling thing, but only in extreme cases, and to answer some very good and distinct purpose; but unless a tree is handsome, or in some degree ornamental, or is useful as a blind to some ugly object from some conspicuous window, it should come down.

Water is of immense use in a landscape, and if judiciously treated and shaped into some plan or figure that is connected with the other scenery, is invaluable; but unless well supplied and always full it is better away altogether. Nothing is so offensive to the eye as a half dried-up lake or pond.

Avoid all harsh straight lines; Nature has nothing like one, and you cannot imitate natural beauties too closely. Where you have a boundary hedge, or canal, or road, of which you must not alter the form or direction, plant it out or break the lines by mounds, trees, or shrubs, or all three. If you want an Italian garden, with its straight walks and terraces, have it so, but let there be no mixture of landscape with it.

In a road up to a mansion, let the house be concealed from the view every now and then for some distance; it is a great relief as you approach, and the effect from the house is equally good when any thing ap-

proaching is lost sight of for a minute or two occasionally.

In neglected places it is common to find deciduous trees and shrubs grown up to a considerable height, but all the lower part bare and unsightly. The worst of them may require to be turned out altogether, for they are commonly too close to the drive to admit of concealing the bare part by other planting. There is a great scope for taste in the judicious adaptation and removal of the several subjects which require the one or the other.

The entrances are generally the worst portions of neglected estates; perhaps because they are the farthest from the house, or the lodge is in the care of some one past labour. Some of the very best estates in the kingdom are very poor indeed, even at the very gate at which the family enters. The noble owners have something more important in their estimation to think of, than the appearance of their park gates and roads; and so long as they are not tumbled about by holes and ruts, they go whisking in and out of their domain without once condescending to notice whether the road is straight or of an easy curve, or like a dog's hind leg.

Gardeners, ever since they were considered necessary, have always had a trick of making things right close to the mansion, and all within a moderate walk of the house, because the owners venture out on foot and leisurely notice the parts within which they ramble; but, as the owners get but a transitory view of all beyond this as they go in and out, and are as often as not reading the paper or a book as soon as their carriage is fairly on its way, they scarcely know whether anything is creditable or otherwise; and so it goes on without amendment, and almost without being kept in any kind of good order beyond such as ensures the carriage running smoothly. This requires amendment, even in what are called well kept places. Every part of an estate should be carefully examined, to see if there be any distant objects that are desirable in a landscape, and such objects should be opened to the mansion or the parts immediately adjoining. The best way to find this would be from the highest parts of the mansion, because the different upper windows over the principal apartments give an idea where an opening is required to expose a good view to the lower ones. We allude to such objects as churches, rural cottages, windmills, rivers, stately trees, castles, towers, rocks, the sea and such like subjects, and the places being remarked from above, the nature of the obstruction should be inspected. If it be trees on the estate, you have merely to consider the extent of the sacrifice, and, if not too great, fell the trees, or cut them partially down, or trim them in, as the case may

require. But if the blind be from trees on a neighbouring domain, try what influence you have with the owner, or his forester or landsteward, or endeavour to buy the timber you want out of the way.

Where trees are too thick, and are injuring each other, look out the best sticks for saving, and remove that which will make the worst instead of that which will make the best timber. It is far better to save handsome healthy trees than faulty ones, although the other would at first bring most money.

In improving an estate, begin with the parts the thousands see, instead of the portions most occupied. The entrance is seen by the outer world, which is much larger than the domestic circle; and whatever affords an example to others is of the most importance. The taste and judgment of the owner is judged of by what people see, not by what they hear. Neatness and elegance within the range of the public eye give an idea highly favourable to the interior, for people from peers to peasants think the best is in sight. The meanest showman puts all his best performers outside, that the thousands who do not enter may wish to do so, and take the first opportunity. This is to meet a sort of prejudice that is universal. Whatever is slovenly in appearance gives the public a distaste, and impresses upon the mind an unfavourable opinion.

Many estates have been too thickly wooded originally, and neglected afterwards, so that it is difficult to find handsome trees to save, and they are perhaps so grown into each other as to form a mass not readily thinned. The only way to manage this is to cut out, the first season, the least important, here and there one, so as to give others room to fill up by growth; in another season others that can be best spared may be taken down, and time will effect an improvement that could not be attempted all at once.

Where the shrubs have grown up lanky and ungraceful, you have to consider whether you can save appearances by planting more sightly things in front to hide the defects; for instance, a tall evergreen in front of the ugly black stems of an overgrown lilac, a very general if not universal object in neglected estates. They always make excellent tops to groups of well chosen shrubs, and can be cut away as the better things grow up. A good standard may often be made of a shrub that is bare at the lower part, by simply taking away all but the most handsome stem, and trimming that up properly; other plants may be very well planted as a foreground or all round it.

Overgrown shrubs in a belt, border, or clump may often be greatly improved by pruning rather freely. Cutting in straggling limbs will often bring a shrub or tree within proper

limits, and cause it to break out and become tolerable, if not absolutely handsome, in one season. The coniferous family are the least manageable in this particular, and they can only be removed when they are once shabby.

It is very common to see the ground completely bare all round the stems of large trees; grass will not grow; indeed there is often no soil, the mere accumulation of roots having reached the surface. In this case, dig the ground as near as you can in a circle round it, and plant it with trailing or creeping plants, which you may peg down inwards, or merely lay them so as to grow towards the tree. Ivy, periwinkles, and similar plants will be found useful in this object.

No ground ought to be in hills and holes, as if they did not belong to each other, but should be all connected: undulating or rising ground should be one expanse, as it were, and present an even although not a level surface. Whatever features the land assumes it should be all in keeping. The eye should command on all sides nothing but what seems to belong to the place; even the adjoining and surrounding scenery should be worked into your own plans, or rather, your own plans should be made consistent with that. Whether it be water or land, hill or dale, wood or pasture, let it be worked up to or blocked out; let nothing be seen but what is consistent with your own views.

At all places where there is a good view commanded, have appropriate shelter, seats, and planting; let every such place be pretty in itself, as well as command a good view. No matter how rough if it be natural, or how plain if it be rural and in keeping; such resting-places on a large domain are highly desirable. To form such places is an easy task; you may have to cut away a tree or two and form a rustic seat, or the advantage it commands may be worthy of a substantial summer house. The former will do any where and every where, but all erections within sight of the mansion should be in the same style of architecture; but if not in sight of the house, it may be in any style, from a Roman temple to a Swiss shed.

Look to the necessity of planting young trees to succeed old ones. In almost every old estate there is the noble timber approaching its climax, or even beginning to decay, and nothing planted to succeed it. The first attention should be paid to proper sites for young timber to occupy, that it may get up into some shape before the other timber is removed or decays. It may be that somewhere near the old would best preserve the feature; but a good deal may be done by adopting another plan consistent with the form of the place and situation of the mansion. All that we

would impress upon the mind is, the absolute necessity of a succession of timber, and of providing it in time, or at least as soon as possible.

Water may be vastly improved, sometimes by enlarging, sometimes by contracting, and occasionally by both. It is impossible to conceive how much can be done by filling up in some places to increase the land, and digging out in others to change the outline of the water, and it is always better to give and take if possible, because the soil taken from the one place can be used to fill in the other. But it is altogether a matter of taste; there can be no rule for it.

Roads ought, in a general way, to go round the park; but it is impossible to set any rule for this, because on some estates the road to the mansion is up an avenue of trees ranged on both sides, and of course unalterable; but it may be considered whether a new road may not be made more advantageous in position, and the old avenue left to grow into a green pasture, or even the material removed to the new road, and the soil dug out for the new road returned to the old. This is also a matter of taste; but it is thrown out as a very likely thing to be desirable where the owner is determined to have a landscape to drive through instead of a straight road and formal avenue.

If a park is too limited for general effect, and there are fields adjoining, ground may be advantageously thrown into it, so as to give an appearance of the greatest space, while in reality not much is added; or it may be that the land cannot be added, in which case it may be so planted and the hedges so blended as to form a part in appearance though not in fact. Clumps of trees, at some distance from the hedge and rather bold, with others intervening and here and there a clump planted to the hedge, will so destroy the outline as to give it the advantage of an ordinary thick plantation.

There is sometimes so limited a supply of water to a pond that it is always three or four feet below the surface. There is only one way to make this tolerable, namely, to slope the ground to the water's edge on the inner side, or that next the house, and to plant the opposite bank with flowers or form it into rock-work. If these cannot be done it is better to fill it up, for nothing is less picturesque or more dangerous than water a few feet below the level ground and not so fashioned. If it be only a small depth from the edge, the ground may be sloped all ways,—that is, all round,—and the water will look natural enough in a valley.

All these several hints must be treated of in so many different papers, and many other subjects will be introduced; but we think enough has been said to set owners of estates

thinking upon a measure of such importance. So many domains are in a state of downright ruin and decay for want of a little money being judiciously laid out ; so many are in bad condition, though the owners are living on them, and, as it were, watching the neglect ; so many that are considered in high keeping are shamefully neglected at the main entrances, that if no others are set to rights, something ought to be done to these to make them worthy of the nation and of the princely income of the owners. But stewards in the care of estates ought to represent to the proper quarters what should be done from time to time, and not allow things to go to waste for want of timely attention. As to those noblemen and gentlemen who are content with a clean lawn and flower-beds near the house, and see timber-trees spoiling each other for want of thinning, and ornamental wood destroying the very nature of the plantation by crowding—or who see gates out of order, fences rotting, banks and ditches occupying four times the space they ought—roads in deep ruts—hedges torn, broken, and decayed, we pity their want of taste, or their parsimony, or both, for it is almost disgusting to those who are proud of their country. We must not hastily particularize, but in the country there are some magnificent estates in a state of shameful dilapidation, and we earnestly request the owners to be thoughtful at once, to employ some practical man—their own gardener, perhaps, as good as any—to say what ought to be done, what it would cost, and how much it would benefit the estates to have it done. We should not then see such miserable entrances to grand estates, nor so many labourers unemployed.

THE NECESSITY OF SAVING THE BEST TREES ON AN ESTATE, AND REMOVING THE WORST.

In this proposition there seems to be nothing but what everybody may be said to know, but there is more in it than there appears at first sight. The best trees on an estate are generally selected for a fall instead of to preserve. The first consideration is, which are the best trees, and there are several points to constitute the best. First, they should be in the best situation for ornament, or at least in such situation as makes them not an incumbrance or inconvenience. Secondly, they should be healthy and unblemished. Thirdly, they should be growing into value instead of declining. Fourthly, they should be handsome in themselves, or capable of being made so. There can be no difficulty in deciding upon the best situation for trees to further the general design of the planting, and as there may be several together, it is just possible that the second best in merit may be the

best for the purpose, for twenty or thirty feet distance may make a good deal of difference in the value of an object ; but every effort should be made to bring in the design so as to preserve the finest ; these should be marked everywhere in such way that no more examination need take place as to comparison, for after once making up our mind, there should be no more time lost. The health of a tree is absolutely necessary ; for to depend on an object that is declining, is to insure a blank, or worse than a blank, at no remote period, and an eyesore much sooner ; if, therefore, a healthy tree of less beauty happen to be close to a more desirable one that is unhealthy, damaged, or out of condition, the healthy one must be made use of, and the other may be lessened, topped, cut in, or otherwise, to give the healthy one room to grow ; and the other may be sacrificed bit by bit yearly, until it is time to fell it. When trees are too thickly planted, and are damaging each other, and it is nevertheless desirable to preserve the effect, those which are to come out may, on being removed, leave the sides of the next, both ways, ragged, leafless, and unsightly. It is better in this case to take off whole limbs, or half limbs of the tree that is to be removed, sufficient to give light and air to those that are to remain, and give them room to grow and fill the bare portion with young wood ; yet there will be enough of the condemned tree remaining to prevent a sudden gap, and more may be done a second year, before it is finally removed. Two seasons of good growth will often make a tree that has been injured by its proximity to others, fill out well enough to stand alone. The trees being marked for preservation, the next thing is to mark those which are for positive removal, either on account of their faultiness or their worthlessness for both appearance and use ; there will then be doubtful ones which need not be marked, but which may await the final adjustment of the proposed plan, and then be either removed or worked up to. That the preserved trees should be growing in value, or handsome in themselves, is self-evident ; it requires no profound consideration to arrive at this conclusion, and here we come to another point in the selection of trees. Some are so valuable as specimens, that however awkwardly they may be placed, they must be preserved, and the plan must be so arranged as to appropriate them. Evergreens of all kinds are of this description. Extraordinarily handsome specimens of all kinds come in, whether of valuable or ordinary kinds of trees or shrubs ; and in a general way they ought to be noted in the survey or plan, as it stands before we commence : however awkward they may be according to the existing plan, they may be brought into a new

design without difficulty. This is the opportunity for a landscape gardener to exercise his skill: single specimens may be studded about a park, or in park-like fields, without detriment to the general scenery, if pains be taken to make all the new work match them; and it is in the planting of new trees to add to the future beauties of the place, without destroying the keeping of the present, that we are bound to be very careful; we are to imagine all of the new ones full grown before the others decay, and consider how it will look as a whole hereafter; with these anticipations every plant should be placed. Whether we apply these remarks to the full-grown or large growing timber-trees, or to the shrubs that are evergreen in the borders, they are equally interesting, and deserve the attention of every body. Among the eyesores on many estates, nothing is worse than the timber in hedge-rows, destroying the landscape, undermining the farmer who cultivates, and invariably injuring the crops; these ought to be destroyed, enough at least to break the row entirely; probably the best way here is, to mark such only as are healthy and handsome, and remove the rest; they are a very unfair tax on the farmer, there ought not to be any trees in a row nearer than fifty yards apart, unless two be as near as thirty feet, and no others nearer than a hundred yards. Again, when they are so far distant, they ought to be kept whole, no lopping nor cutting; and a farmer will rather like this than otherwise, for it is a shade, without drawing a tithe of the drainage which short trees in a hedge-row do. This is carrying out our notions in part, and there is enough in this to set everybody at work in the proper season.

THE WORKING OF A GROUND-PLAN TO APPROPRIATE ALL THE BEST TREES.

This is almost past our art to give ample directions in writing; it is so thoroughly dependent on taste, that we hardly know how to make it clear without several examples; however, there are a few rules that may help us out a little. A domain may reach half over a county, but there is a certain quantity of land devoted to park, garden, and the immediate purposes of the household. Now it is quite certain that a road should surround all this, or rather that a road should be so constructed as to be somewhere near the boundary all round, though the actual extent may be concealed by planting. In forming this road you have simply to take care that you have a gentle curve all over it, no matter whether to the right or the left, or serpentine, sometimes one way, sometimes another; but you must have no sharp elbows, no harsh turning, no corners; the eye must never be offended by awkward

angles. These slight curves may be found useful to avoid hollows, or to bring us near fine trees, or to avoid water or other interruptions; in short, the road should be so constructed as to show fine objects, and avoid ugly ones; also to get away from the boundary line where it is too palpable. This road should be made by digging out the space full eighteen inches, and if the ground be not pretty solid, two feet deep, and filling it with brick rubbish, flints, gravel, clinkers, or waste rubbish of any kind that is of a dry hard nature, broken bottles, chalk, large stones of any kind, but it must be something calculated to form a hard substantial ground for carriages to run over, and not give way. It is presumed that the ground is already properly drained, for unless it be so, no road can be serviceable, nor can the land be half so good as when the proper drainage is first secured. The proper width for a road is fourteen feet, that two carriages may pass, although it is not proper to force vehicles to return by the same road they go in at, nor, if it can be avoided, ought they by any means to return through the same gate, unless the gate be double, so that the return may be uninterrupted by those which are entering. In small grounds, roads may be as narrow as eight feet, but they look very pimping and trifling in a large concern. The road may in some places be the most expensive of all the operations, because, supposing it be only excavated eighteen inches, and only nine feet wide, every two feet of road in length requires two full loads of soil to be removed, and two full loads of materials brought back again. We remember, and it is not half-a-century ago, a sham road being made in a very respectable place, for the soil was only removed six inches deep, and gravel placed there to fill it up; the effect, to look at, was the same, but as the road was never used there was nothing to show its deficiency. It was something like Mr. Beaton's baby-gardening, which consisted of cutting boughs of evergreen and trimming them up like dwarf shrubs, when they were stuck in the ground to imitate a plantation of dwarf evergreens. The sham road was much about the same; the only people who would have any right to complain would be those who at a subsequent period took the place, and calculated on having a road, instead of a place in imitation of it. The proper way to make the road is to peg the space out with wooden stakes, a foot high, and of a colour to be seen by the eye at a good distance; (new laths are perhaps the best things,) they must be placed at about an equal distance, so as to represent the curve well enough for general purposes, and this done the turf may be removed from one side only. This being once adjusted, all we have to do is

to make a road the length that we intend the road to be wide, which should not under any circumstances be under eight feet, it is better the nearer it comes to fourteen; and by means of this rod place the pegs for the other side, for if you have adjusted the edging on one side, the pegs may be removed at once to the opposite, and this will make the road complete, so far as the plan goes—excavation, and the removal of one stuff for another, does all the rest.

THE MANAGEMENT OF THE ROAD UNDER VARIOUS CIRCUMSTANCES.

We have already said that the road must have no elbows too sharp, but must go in an easy curve. To do this so as to avoid particular objects which stand in the way, you must begin soon enough. It is of no use planning the road so as to be all you want three parts of the way, and then to require a sudden bend when you have gone too far to do it easy. If you find a considerable hollow the way you wish to go, you have only a choice of going round it or filling it up;—if you have a clump of trees which interrupt your desired route, you must cut away through them or go outside them; but the proper way in both cases nine times out of ten, would be to go round, and take the route into your original plan of the road. For this reason, nothing should be done towards cutting a road, until it is pegged out all the distance, that all the obstacles may be seen. Water ought not to stop a road, nor to make any serious deviation, if expense is no object, because a bridge may be made both useful and ornamental, and there is not a prettier object than an appropriate construction. It does not look well to see a massive stone bridge where every thing about it is rural, nor would a rustic bridge look appropriate within sight of a stone mansion. The bridge, when resolved upon, should be so constructed as to form a distinguished feature in the landscape, in which case it must be appropriate with the surrounding objects, or it must be so subdued as to appear literally to be placed there for use only, and not ornament. It is, however, very easy to make it an addition and an improvement to the general landscape. If it is to be a rustic bridge, which can always be formed cheaper than anything of masonry, and the site is too near the mansion, or to some object which requires to be followed as to style, there is only one way to get over the difficulty—plant the one or the other object out altogether, so that the two cannot be seen at the same time. If the water be something like a lake, it may be necessary to change the form a little by filling up a portion, to narrow it; if it be like a canal, the form may be altered

by widening, but the widened part may be very shallow, the principal object being merely to enlarge the surface for the sake of appearance; and the shallowness is an advantage, especially for the planting of aquatic subjects to bloom on the surface. But to get back to our principal subject, the management of the road through water: we have given an example, not an imaginary one, for we have to execute it. The outer line of the lake was its original size, the dotted line shows the reduced size. Part of the water is in another man's ground, and therefore there is no control. There was no legitimate, no really proper line for the road but the one pointed out in the sketch, and the only choice left was to fill up the part of the lake that was in its way, or make a bridge; and the best way to make the bridge was to narrow the piece of water in as natural a way as possible, due regard being had to the portion belonging to others; and that which would have been a botch, a failure, a loss of half the appearance, becomes an imposing scene, greatly enhanced in interest and importance by the very obstacle which presented itself to the proper conducting of the road. By narrowing the water and carrying over a bridge, and by judiciously planting out the boundary line, there is nothing to show that the other portion of the land is not belonging to the owner of that on the principal side of the sketch. The park or park-like grounds are vastly increased in appearance and value by the piece of water in question, and there was no reason for deviating from the same line as would have been formed had there been no water. But, unfortunately, not one in ten looks at things as he ought. Many have seen water, and would not even think of carrying a road through water. Yet let any one see the enormous change that must be made in this road, if the bridge, or stopping a road out of the lake, were not resorted to. The question of a bridge or a road formed in it so as to separate the water, will hardly bear a discussion. The one is complete, and carries out the very first and best principle of landscape gardening; the other would separate the lake into two distinct pieces of water, and be offensive to the eye. As, however, we are simply discussing the principle of road-making under a disadvantage, or turning an obstacle to account, we will leave the water out of consideration, except as one of those obstacles which would be in some hands insurmountable, but which we should like to see always turned to account. It is the same with a noble clump of trees; you cannot sacrifice the road you are forming without detriment to the concern as a whole, and it is necessary in this to be determined and sacrifice all minor considerations to one

great natural one. Do the thing properly, or let it alone.

FORMATION AND COMPLETION OF ROADS.

After a road has been marked, as well as it can be, with pegs, and dug out for the reception of the gravel or other coarse material to form a good dry, hard bottom, the edges should be made even and smooth for about two feet on each side, and curves, cut eighteen inches wide, should be laid very carefully on the margin, and in a proper sweep, free from corners and sudden bends, which display themselves on the grass verges better than with the pegs. You very frequently find that you have to deviate a few inches one way or the other, to make the curves graceful and handsome. After the verges are laid on one side, prepare the other, and in doing that you will have to be very careful not to deviate in the width of the road. This must be ascertained in the most accurate manner by means of the rod, which must be placed across it in a proper direction, as swerving one way or the other will make a difference. At the curves, therefore, the greatest care must be taken to place the rod exactly straight across the road instead of parallel with each other, as any slope or deviation from the exact straight line will make a material difference in the width of the road at those points. The verges being thus properly laid, the sides of the road may be trimmed down previous to the stuff being wheeled into it. The filling up, rolling, and gravelling, or topping with road sand, must be all done without doing any damage to the grass verges, which, in fact, ought not to be trodden on all the while the road is about. If you are obliged to wheel across, put planks or some other protection, or take up a length of turf where you have to trample much. The portions outside the verge have either to be made good with turf or levelled and sown with grass. But if a road has to be made through a sort of pasture, all the turf in the space meant for a road should be cut properly and rolled up for use, or be laid up and rotted for compost. In this case it is not well to let the turf already on the verges of the road remain: it is better to cut away the turf some distance beyond it, say two feet on each side at least, because the verges should be all formed of the best turves, and the laying of them gives us the first accurate notion of what the road is. The pegging shows it a little and gives us a general idea, enables us to form our plans and lay down the principal features; but it is only when we lay the green edge on our new work that we can see the deviation of an inch almost, and set all the curves and bends to rights. For, strange as it may seem to those unaccustomed to mea-

sure by the eye, the least deviation from the proper line is offensive to the landscape gardener, who can appreciate to an inch the place he designs for each distinctive feature; and nothing destroys the harmony of any plan so much as an improper bend in a road or gravel walk. Nature exhibits very harsh lines; she may be rough and rugged, but never ungraceful. Scenery always matches in every part; there is nothing violent, except in a broken country, where crags and precipices and cliffs and cataracts or rapids seem all to harmonize even in their violence. And in landscape gardening the same harmony should prevail. In calm scenery nothing should do violence to the surrounding features, but nothing is more important than a graceful road. As this deviates from what would appear a direct line, let there be some object placed to account for it, that is to say, something that should seem to prevent its going direct, a clump of plants, a mound, trees, or something like it; so that after having made your road as nearly to your taste as the real objects to be brought in or avoided would let you, the next thing to consider is what planting, or mounding, or other artificial working may be necessary to complete the plan. Of all the features easily constructed and effective when done, nothing beats a well-made, neatly formed clump of shrubs and trees. But due regard must be had to the cattle or other animals that will be allowed to disturb things, and it would be well if nothing but sheep were allowed, and that there were always folds; for they will eat off the grass best after the hay has been got up, and are the most easily managed. Clumps of shrubs and flowers judiciously placed about the grounds, but always next the road, are consistent with high keeping, and it is a pity that those who have princely means should be so parsimonious as to do anything but mow. The flowers and flowering shrubs might then be as effective as they are in the home garden, and the place would look all of a piece. If the place be extensive, it might be desirable to have deer on the centre portion, in which case there should be a fence within the road so as to part it from the centre portion; an iron fence sufficient to keep out sheep as well as deer from the road and its dressed clumps and borders, for of course there could be no hope of flowers and shrubs being preserved, if either the one or the other, that is, either sheep or deer, had access to them. It is only necessary for the boundary to be wide enough to give plenty of room within the fence appropriated to the road. There ought to be at least fifteen feet to twenty-five feet of grass on the inner side of the road, and the fence should be even then what is called invisible.

The admission of deer to the park being for the sake of appearance, the sacrifice of the cost of the fence is a natural consequence, and it cannot be questioned that they are a noble addition to the large expanse of grass which is comprised within the road of a good park. There are those who will listen to no proposal for flowers within a park. It is no use to argue with such persons. Park and park scenery upon a gigantic scale are worthy of attention, and require as much, but nobody can compare the mere trees which bound and ornament a park, to the effect produced by flowering shrubs and flowers. We will not question for a moment the fact that it is cheaper to keep up one than the other, but we would have a road through flowers and flowering shrubs, and diversified with the different styles of clump and border that form excuses for the introduction of all the fragrance and beauty of the well-kept garden. However, the road will be the same in all cases.

OF THE PLANTING.

* We are presuming now that the road is completed according to the principles laid down, and that we have now to complete the planting of those groups of trees and those clumps of ornamental shrubbery that we place to render the turnings of the road and the sweeps which are to give a picturesque effect consistent. We are no friend to small clumps of either shrubs or trees, and although we like to see mixed foliage in front, we are decidedly friendly to groups of particular genera without any particular intrusion of other subjects. In one clump we would have all the distinct varieties of holly, for there is scarcely anything more beautiful. In forming and planting these, regard must be had to the probable growth of a few years. While young, the clump should be a gay shrubbery, and as they advance they should assume the character of ornamental timber and be consistent. The most rapidly growing kinds should be in the middle, the less rapid and the slowest should come nearer the edge. And although for effect they may be planted closer than it would be wise to leave them, the specimens that are to remain should be placed in proper order; and those designed to fill up for the present should be put in the intermediate spaces, and be removed as the permanent ones require room. What with the different coloured foliage, the different character of the leaves, and various shades of the berries, there is hardly a group that can be made more effective. There is another tribe that will be almost if not quite as effective,—the firs, and they form a beautiful group, from the varied character of the foliage, and the many different tints; and here the same rule should be

observed: the fast growers that tower above the others should be placed in the middle, and the lower growing kinds outside. The effect of these clumps will be more striking than any one at first sight or thought would imagine. Then upon a smaller scale we have the *Magnolias*, forming a very pretty group, both for the variety in the bloom and the difference of the leaf; but the extent of hardy sorts does not warrant a very large clump to be attempted. The *Arbutus*, again, presents another temptation; the scarlet, the white, with *Andrachne* and *procera*, are especially effective, not only in the foliage and habit, but also in the flower and fruit. With regard to *hollies* and the *Pinus* tribe, there might be several clumps, all differing materially from each other; but having, in a large establishment, provided for a number of these distinct clumps, we come next to those of a mixed character nearer the mansion. In these, standard deciduous plants may form the centre row of the clump. One may have half a dozen striking varieties of thorn; another may have standards—of a proper height, be it remembered—of double-flowering almond, *Guedre-rose*, *Laburnum*, *rose-acacia*, double-flowering cherry, mountain ash, *Pyrus spectabilis*, and other deciduous trees remarkable for their bloom, and of not very enormous growth. Next to these may be planted *Laurels*, *Holies*, *Bays*, *Alaternus* and other tall growing evergreens; and forwarder still, or rather, nearer to the front, slower growing evergreens, or such as may be kept down with the knife; these comprise box, *Rhododendron*, *Kalmia*, *Azalea*, *Andromeda*, and many others; intermingled with which may be a few of the best deciduous flowering plants, such as *Magnolia purpurea*, *Pyrus japonica*, red and white *Magnolia conspicua*, dwarf almonds, *Ribes aureum* and *sanguineum*. By a little attention to the disposition of these, a clump which is to all appearance essentially evergreen in its combined character, may possess some of the best flowering deciduous plants without destroying the general freshness of it even in the depth of winter. At the very distant parts, and near the entrance, there may be groups of deciduous trees, but some regard may be had to what is ornamental. The horse-chestnut, for instance, is a noble growing tree, and there are several varieties that can be planted together. The evergreen oak, if raised from seeds, yields a great variety of habits and foliage; groups of these are very ornamental. The different species of deciduous oak might be intermixed, and so add greatly to the variety. Beech yields its share of change, not losing sight of the purple; but we might go on at any length enumerating the different subjects that are appropriate. The grand

consideration is to make a place look well in winter by a little extravagance in evergreens, so that there would be the same freshness at Christmas as there is at Midsummer, instead of approaching the mansion under the frowning black branches of leafless trees. With regard to the formation of the clumps, wherever they be, there should be a positive line made exactly twelve, fifteen, or eighteen inches from the edge of the road, according to the width designed for the verge all through the place, and whatever be the form of the clump outside or next the grass, the inside or next the road should be the same distance the whole length it goes. Generally the length is determined by the size of the place, and a clump might go alongside the road for twenty or thirty yards, or even twice that length, while in width it may vary the whole distance. It may begin, as it were, at nothing, and widen as it goes on, till it is thirty or forty feet wide, or perhaps half the width, and then be brought round with a bold swell and brought back again in form of part of a circle, and terminate only a little further than the bold part stands out. These crescents or circles in good bold clumps, form excellent spots for specimen plants; on the outside of the road the plan is somewhat different, because the road is supposed to be nearest to the boundary. The border that is planted next the boundary is made in some places very narrow, merely enough to plant in and hide the fencing, wall, or boundary hedge; at other times it may be brought up within the width of the verge of the road itself, and continue so for some distance, then recede again, and particularly if there be depth to make it do so sufficiently to introduce a small independent clump between the road and the border. But all this is dependent on the capacity of the place; even the independent clumps should be within just the width of the verge of the road, and nothing contributes so much to the natural and landscape-like order of a place as the truth which is kept up in the width of the verges, which should be observed in all cases, even though there be a large space between the road and the boundary. No clump should be seen that did not actually join the road its whole length. When we begin a bit of landscape scenery, and are making the road and laying down turf, the place intended for a clump should be left without grass; but if we are making it on a place already grass, the proper way is to make the cut along the edge of the road, say just eighteen inches distance, then cut down just through the grass, all the way the clump is to go, and then fairly cut through where it is to reach, or, in other words, cut the outline. Then cut straight lines across the clump, and with a turving iron cut off the turf, rolling it

up in yard lengths, and carrying it out of your work. The ground then is to be trenched two spits deep if it will bear it without coming to bad soil; and the bottom is better for being loosened. This being done it is ready for the reception of the trees and shrubs. Holes should now be dug large enough to take in the roots of the trees intended to be planted, and the planter ought himself to see to the taking up of the trees he is going to plant; for unless he has all the roots and fibres to the trees and shrubs, and is left to his own pleasure about pruning them or not, he has only half a chance of doing well by them. The distance for planting depends on many circumstances. If he wants immediate effect he must plant many more than can remain, but those which are to remain must be placed where they are to stand. According to the nature of the tree so must be the distance, from seven to fifteen feet apart for the ornamental standards, according to their upright or spreading habit, rapid or slow growth. Ten feet for thorns would be the least; most of the firs will require that, and all large growing specimens will want as much, while the red cedar, *Arborvitæ*, Irish yews, and such like wood, do at half the width of this. Moreover, the planter must acquaint himself before he begins to plant, where the specimens which he designs for permanent ornament are all placed; he may fill up with plants that will move well in three or four years, and be prepared with a place to plant them when the growth of the permanent inhabitants renders it necessary to give them more room. But if immediate effect is not required, let all things be at once placed and left to their proper growth. As we approach the mansion, the subjects planted should be more choice, and the borders and clumps be left with two or three feet width outside the high shrubs, to be used as a flower border, and for choice dwarf subjects, while those in the immediate vicinity should have very dwarf and very choice shrubs, plants, and flowers. Those clumps in front of the windows in the portion to be kept mowed as lawn, should be made with great taste and planted with great care; and if cattle are to be admitted within the enclosure, an invisible fence must be placed all round within side all the clumps, and across wherever the lawn is to be extended. It is not, however, uncommon to enclose with an iron fence a portion to be made into shrubbery, and garden, and lawn, and to plant all the rest of the road very roughly, so that it appears as common as an ordinary roadside. This, however, is not what we profess to recommend. We would rather have the fence to enclose all that is within the road, and to sever the lawn from the inclo-

sure by an invisible fence also. It is not unusual to cut out fantastical figures on the lawn, but the most we can tolerate would be one or two round clumps, to plant so as to imitate flower baskets, by means of a wire work side and a handle across it, the clump then to be planted with mixed flowers, to be always like a basket of them. The proper way of making clumps for flowers is to have them cut with the same verge, and make the outline that is next the lawn into any graceful form. Nothing looks so contemptible in our estimation as a parcel of fancy shapes cut upon grass; nothing so effective and beautiful as the full expanse of green carpet for all the centre, and whatever flowers there are round in the fanciful clumps on the side next to the road or path. By the same rule no specimens ought to be planted out in the middle of a lawn, nor in any portion that is far removed from the edge of the road. We have gone many times over establishments totally spoiled by the patches of beds and specimens of shrubs stuck all over the grass, interrupting the view, always appearing in a litter, and conveying an idea of frivolity. If specimens are wanted, let them be put far enough from the road to secure us from their coming too near by growth, but not further, and it should always be in those parts where there is no clump, or when the clump has narrowed so much as not to interrupt the view of them. Handsome specimens on the side of a road are not only good in appearance as single objects, but, if judiciously placed, in a permanent establishment, fall in with the general effect given to the particular turns of the road. Always take care that no tree be too large for its place. Remember that what may look very pretty in 1848 may look very ugly in 1858, and all planting should be done with a view to the change that is made by time. Some idea must be formed of the tree at maturity, and room must be given to attain it. Even shrubs which we calculate make but slow progress, become in a comparatively short time unmanageable, unless regard has been had at the time of planting to the room they will one day occupy, and the next subjects to them, that they may be removed to make way without spoiling the then effect of the place. Perhaps no distinct rules could be laid down for the planting any more than for the laying out of a place, but general principles may be adhered to with advantage.

OF THE FLOWER GARDEN.

The flower garden may be, as we have before hinted, somewhere adjoining the glass houses, and totally out of the view of the landscape portion. The beds may be geometrically disposed in a pleasing figure, and

edged with box, and nothing but gravel walks between them. On no account should a flower garden be cut out on grass; it is a bad taste, and if it be at all frequented, the grass gets damaged. The gravel walks between the beds of a geometrical garden should be the same width all over, not wide in some places and narrow in others. The principal walk round the outside of the figure may be as wide as we please, but in the figure itself it should not be more than eighteen inches. There should, however, be a circle in the centre, that people may stand to see the effect of the whole figure, which should be uniform, or the whole compartment might be divided into two uniform portions. But so diversified might the plans of flower gardens be, that were we to give fifty sketches, we might not give one that would suit the taste of a gardener. All we care to do is to lay down as a general rule, that the beds should be of such size and form as to be distinctly seen when furnished with flowers, and not too small, that the gravel walk all through the figure should be the same width all over. This flower garden should be completely independent of the general features of the place, and therefore completely a matter of taste. In the disposal of those choice dwarf flowers that make a conspicuous show for some time, and in disposing of the colours, they should be placed uniformly, so that the eye may not be offended with the predominance of any thing on one side. If the work is from a centre, not less than three beds out of six, or four beds out of eight, should be of the same colour. If the figure proceeds from a straight walk through the middle, and is therefore square or oblong, the same colours should be opposite each other. In this flower garden, which is purely artificial, there may be any kind of ornament introduced, vases of flowers on pedestals, statues, fountains, and any kind of fanciful arrangement may be permitted, but it should be completely isolated from the general features of the place. There can be much of this done in an old and neglected place, for the additions may be made without disturbing a present mansion; and a place, like many old establishments, remarkable for the inconvenience of every thing about it, the awkwardness of the approaches, gardens, glass houses, and out-buildings, and want of taste throughout all the arrangements, may, by well-applied labour, and judiciously spent money, be converted to a first-rate and well-appointed establishment.

OF THE BUILDINGS AND OFFICES.

Nothing contributes more to the comfort of an establishment than appropriate offices in appropriate places, and these should be so

contrived that the domestic offices should form one wing, and the conservatory and horticultural buildings the other. The domestic offices should comprise the kitchen, which for obvious reasons should be next the house; beyond this the servants' hall, scullery, servants' rooms, stables, stable-yards adjoining the kitchen garden. All this by judicious arrangement may be so contrived, that the stable will be sufficiently distant from the house to avoid any nuisance, while the proximity of the kitchen garden and melon ground saves labour in the transmission of the dung to the place in which it is used. On the other hand, the conservatory may lead to the stove, and the range of greenhouses one to another, for the convenience of furnishing the conservatory with the best objects from the other houses, or of visiting the other houses without going out of doors. The conservatory should be entered from one of the principal rooms of the house by glass folding doors, so that the best view of its contents should be seen from the room. The extent to which the houses may lead, will of course depend entirely on the owner's taste and means. The conservatory might lead to the orangery, which, notwithstanding so much has been written in favour of darkness, should be nearly all glass like the conservatory. This may lead to the heath house, camellia house, geranium house, or ordinary mixed greenhouse, stove, &c. But some taste must be used in the building, and in the direction which the successive houses take. It may not be advisable to stretch a great length of building in a straight line. The aspect will in some measure determine the proper direction, but the glass or horticultural buildings might form almost a quadrangle, with a regular Dutch garden, and fountain, statues, &c. within the square, in the same way as the offices might, on the other side, enclose a space. Still, when there is ample space, it is far better to let all the show houses range in a direct line, so that they might, when thrown all open, be commanded from the entrance. The style of the out-buildings must be dependent on the architecture of the house. In addition, however, to these home buildings, temples or summer houses should be placed so as to form pretty objects to look at, and to command the best views. Not that it is necessary to see the entire form or front at one view, for it is better to partly conceal it with shrubs and appropriate trees, and perhaps nothing has ever been worse done than this part of the embellishment of estates. All manner of fantastic forms have been adopted for summer houses, but seldom have they been at all appropriate. Rarely have we seen anything bold or imposing. Nothing can

justify rustic work within sight of ordinary buildings; therefore it is a safe rule to lay down, that all such subjects, rustic summer-houses, seats, arbours, &c., should be out of sight of any regular building, nor should there be any carpentry or plane fittings about them; but it is not at all necessary that a summer-house should be in the same style as the mansion. It may be Ionic, Corinthian, Doric, or any other style of architecture, or there may be at different points totally different subjects, but they should not be in miniature. Nothing looks worse than things of this kind on a small scale. The very smallest that we should tolerate would be twelve or fifteen feet square or round, and it should be convenient in all respects as any room in the house, except that it should be open in front, or all round, as the case may be. As we have before observed, it should be always on a spot commanding a desirable view, and where it also forms a pretty object, even if a distant one, from the mansion itself.

CURIOSITIES OF THE VEGETABLE KINGDOM.*

THIS is one of the many hand-books which have been published with so much advantage by the Society for the Promotion of Christian Knowledge. It contains a well selected collection of subjects, the most curious or wonderful that have been found in the Horticultural world, and there is no better way of describing it than by giving two or three extracts. The getting up of this volume is, like that of all the rest of those works, excellent in all the departments.

“THE TANGHIEN TREE (*Cerbera Tanghien*).—The fruit of this tree has been long noted in the Island of Madagascar, as a native ordeal. The tree resembles a plum-tree, but its fruit is one of the swiftest and most deadly of vegetable poisons. The late King Radama, who had become somewhat enlightened, from his intercourse with Europeans, discouraged this dangerous custom during the latter years of his reign. His successor, the present queen, has, however, permitted its revival, and, particularly in a case in which she herself was interested, made this abominable practice far more universal than it had ever been in any other period of the Hueva government.

The greatest crimes, for the detection of which this poison has been employed, are, conspiracy against the reigning monarch, accusation of sorcery or witchcraft, (the great

* Curiosities and Wonders of the Vegetable Kingdom. London: Published by the Society for Promoting Christian Knowledge.

dread of the inhabitants,) and the charge of being a poisoner. It must be observed, this ordeal is used where other proofs of crime are wanting. The Hueva (the inhabitant of Emerina) on the slightest indisposition or suspicion of having taken poison, assembles his slaves, and administers the Tanghien to them indiscriminately, in order, as he thinks, to detect the malefactor.

"Besides the more heinous crimes alluded to, the Tanghien has been used to detect persons charged with murder, burglary, &c. It is also frequently employed in settling disputes about property, but in such cases it is administered to the dogs of parties concerned, and of course the owner of the dog killed by the test is convicted in the penalties of the law, and is compelled to pay a fine as an asserter of false rights.

"The way it is used is as follows: The accused person, having eaten as much boiled rice as possible, swallows, without chewing, three pieces of the skin of a fowl employed for that purpose, each about the size of a dollar. He is then required to drink the test, a quantity of scraped or bruised Tanghien nut, mixed with the juice of Bananas. The Panozondoha (denouncer of the curse) then placing his hand on the head of the accused, pronounces the formula of imprecation, invoking all direful curses on him if guilty. Soon after this, large quantities of rice-water are given, till the stomach rejects its contents; when, if the three pieces of skin are found, all is well, the party is pronounced 'madio,' or clean, legally and morally innocent of the charge; but if they are not found, he is considered guilty of the crime in question. Sometimes the corrosive nature of the poison acts with such rapidity, that life is destroyed before the ordeal is completed. Should the test prove the guilt of the party, and yet Tanghien itself have not produced immediate death, the accused is generally killed by the bystanders; a club, a spear, or the rice-pestle, is used as the murderous weapon, and the brains of the unhappy being are dashed out on the spot. Sometimes the victim is strangled; in other cases the miserable sufferer is hurried away and buried before life is quite extinct. In some cases the guilty are left to perish in excruciating agonies, deserted by every one, family, friends, and all.

"In the early part of the year 1830, the present Queen of Madagascar, who was ill, imagined herself to be bewitched, and thinking that the death of the sorcerer alone would remove her complaints, desired that her land should be cleansed from sorcerers; and accordingly an ordeal was commanded in every town and village.

"On the 9th of March, in obedience to the

sovereign's mandate, the ordeal began. The accused persons, amounting to about thirty, including some of the highest in birth and rank in the kingdom, underwent this test. All the nobility recovered, while the common people, who, according to the usual jugglery, had been compelled to drink with them, died. The former, after their acquittal, made their accustomed entry into the town, borne in open palanquins, amid the shouting, dancing, and grimacing of thousands of the people.

"An aged widow attended the administration of the ordeal to five of her children in one day, all grown up, and having families. The first was proved innocent, the mother rejoiced almost to ecstasy. But ere the day had closed, she had to mourn the loss of three out of the five, and the orphan children were committed to her feeble succour.

"In the following month of April, the queen not having recovered, about an equal number of Malagassy ladies submitted to this disgusting ordeal; including the late king's wives, his sisters, and others of the royal family, the wives of the chief officers, and daughters of judges, with a few men, amongst whom was one judge. They all survived, and in due course made a grand entry into the town. Various inferior officers and common people drank with them, of whom one officer and several of the latter died.

"Among the ladies, was a princess from the Saccatawa country, whom Radama married. She had been treated during his reign with more respect than any other female; but, having on one occasion attempted to run away and regain her native country, she had subsequently been closely watched, though not subjected to actual imprisonment. Her establishment consisted of a few Saccatawa servants, and displayed no kind of pomp. Thus defenceless and unprotected, it was absurd to think the princess could injure any one; and there was a peculiar severity in her case, as she had no friend to watch over the fairness of the administrator's conduct, or to rejoice in her recovery. She wept bitterly when passing to the place of trial, and the natives sympathised with her by what they term 'mifady ahitra,' or an adjuration of the grass. This is performed by plucking up a piece of grass from the ground, and holding it up, as to express, 'May such misfortunes be far from us, as we would avoid treading on the very grass of the village where such sorrow dwells.' On the day of the ascent to the town, after the acquittal, this princess acted with a dignity quite peculiar to herself. Whilst all the others remained some time in the country to dance, gesticulate and receive congratulations, she proceeded home, without pausing anywhere, her attendants making a

mere humming sound expressive of joy. The queen showed some good feeling by sending her especial congratulation, saying that, 'though Radama was gone, she would be a mother to her, and never injure her.'

"In May, after the females had undergone their ordeal, the administrators themselves were compelled to drink along with the others, making in all about sixty persons. Two of the former and two of the common people were victims, and the survivors made the usual triumphal entry.

"After this, the Skias, or diviners, took their turn, several of whom died. The particulars of the death of one are, that 'his stomach became prodigiously swollen, his legs enlarged, his features distorted — and he expired in great agony.' Those who lay accusation and administer the poison are great pecuniary gainers, as a dollar and fifty-three cents is given by every one who recovers, besides perquisites and private presents. When the accused dies, the officiating squad receives one twenty-fourth of the whole property not bequeathed before the accusation. The diviners also reap a large harvest from these iniquitous practices. They attend daily for eight or ten days before and after the drinking takes place, and receive one dollar, or many, according to the wealth of the accused.

"When the accusation is made, no circumstance prevents any delay, no excuse is available. One of the officers accused in 1831, was actually watching the corpse of his father when the appointed person knocked at his door. He begged to be excused till after the funeral, declaring that he asked only a few days' delay, and not exemption; no delay could be granted, and he was dragged from performing the last offices of filial affection, to the scene of ignominious and protracted trial. In another instance, a man was ill of fever, and unable to walk, yet no delay was permitted. He drank, and some credit was due to the Tanghien in consequence, for the violent sickness cured him completely of his fever. In such harsh cases, the nearest relatives and dearest friends dare not interfere, from the dread of being personally accused of holding league with the guilty, and thus being themselves compelled to drink. The deception practised in the whole transaction is evident to every sensible native.

"It is well known that the selection of the fruit of the Tanghien requires great care, and that a mistake in this respect may destroy the innocent, or save the guilty. Thus the administrators have it in their power to permit any criminal to escape, and for a small reward they often exercise this partiality. They frequently recover slaves who have been

pronounced dead, by giving them copious draughts of water, in which certain herbs have been boiled. The individuals so saved are sent to a great distance and sold, as they cannot be suffered to remain in the place where the ordeal has been administered to them, and they are disposed of as 'prize property,' their own fear preventing them from ever disclosing the transaction to the families of their new masters. Thus, among all the rich nobility who drank of the Taghien in 1830, not one died. It is equally certain that the administrators can sacrifice whom they please.

"The fruit which appears very red is protested against by the friends of the accused, on the tacit understanding that such a fruit will destroy, whether innocent or guilty. On this account, during the ordeal of 1830, a few of the common people were always seized upon and compelled to partake with the nobility, and they usually consisted of those who had no friends or relatives to stand by them. It seems to be necessary that in every public administration of Tanghien some should perish, otherwise the judicial virtues of the plant would be considered of no avail.

"One of the chief officers during the trials of 1830, had the misfortune to vomit while eating the three spoonfuls of rice; in token of perfect recovery, he was appointed to drink again in a few days, along with the slave who had carried the water for him, and who it was pretended had perhaps bewitched him. The officer recovered, but the poor slave died, such being the common mode of saving the reputation of the priest. As to the cause of the different operation of the fruit, sometimes acting as a poison, although generally as an emetic, no certain and satisfactory reason can be given. It is known that a difference, visible even to the naked eye, does exist between that fruit which only occasions sickness, and that which destroys life. The latter always presents a slight appearance of redness. The people declare that this hue is miraculously assumed, and regard the change as an infallible sign of death to the accused. Yet if this redness be exceedingly obvious, the relations who are present desire that such a fruit may be rejected, and another chosen. This proposal is probably agreed to, but the next fruit exhibits the same ominous colour, and the victim dies. Several opinions are held by the natives on this subject. Some say that there are two kinds of trees, one poisonous, the other only emetic, and so similar in appearance, that none but the administrators know the difference, and that they even sometimes err, in destroying when they intend to save life, or saving when they intend to kill.

"Another opinion is, that the fruit under-

goes a change by age, when a slight putrefaction or decay takes place, and it becomes poisonous in the centre. It then falls from the tree, and is distinguished by being withered, and drawn into wrinkles externally.

"The question as to what constitutes sorcery, is enveloped in great mystery. The existence of such supernatural agency is firmly believed by all the Malagassy, not excepting those who have learned and felt most of the power of the word of God. Many of these will admit that the whole proceeding of the Tanghien ordeal is but a money getting artifice, yet none will allow that no such thing as sorcery really exists. They aver that incontrovertible proofs can be adduced of persons being bewitched becoming, without any other assignable cause, either fools or madmen, and acting as if entirely destitute of reason. There is no limit assigned to the supposed power of sorcery; every evil which the Malagassy feel or fear, which they understand or do not understand, is ascribed to its influence.

"But although no very distinct information can be gained of what constitutes a proof of sorcery, yet several signs are exhibited after the accusation, to those conversant with the business. The guilty person on being apprehended makes a boisterous assertion of his innocence, assuring his friends with the utmost confidence of his approaching escape. Various prognostics that are observed on the way to the place of drinking are unfavourable to him. On killing the fowl, of which the soup is made for the vehicle of the Tanghien, if the heart is observed to incline to the side, instead of being upright, it shows that the accused is 'malaka,' that is, crooked or guilty. The Tanghien turns reddish instead of pure white, the vomiting is attended with great pain and difficulty, and the skin is dry; whereas the innocent vomit easily, and perspire freely. Uneasiness and distress mark the whole appearance of the supposed guilty person; the eyes of the sufferer become red and fiery; he is unwilling to eat the rice or drink the rice water; swelling of the body and other signs of death appear; or if these symptoms do not come on, the poor wretch is presently killed, on the ground of the obvious signs of his guilt.

"It is needless to make comments on the revolting character of all connected with this subject. At present, so deeply rooted in the minds of the Malagassy, from the sovereign to the slave, is the belief of sorcery or witchcraft, and so blindly are they led in this belief, that the whole nation may be considered as labouring under a spell, which can only be removed (and would the time were at hand!) by the introduction of Christianity amongst

this darkened generation. This and all other evil practices and doings will then fast fade away.

"A somewhat similar kind of ordeal, practised in the East Indies, is mentioned by Warren Hastings, in a communication to the Asiatic Society. In this case, the person accused takes a certain portion of a poisonous root mixed with clarified butter. It must be eaten from the hand of a Brahmin. According to the Indian law, the person put upon his trial was to say, 'Thou, O poison! art the child of Brahma, steadfast in justice and in truth; clear me from this heavy charge, and if I have spoken truly become nectar unto me.' Saying this he should swallow the poison, and if he digest it, without any inflammation, the prince shall pronounce him guiltless. In this, as in the ordeal by the Tanghien, the guilt or innocence of the accused entirely depends upon him who administers the poison, as none but himself can know whether the substance swallowed is deleterious or otherwise. The rich man, who could afford a bribe, might be tolerably certain to escape; while the poor man, who could not afford to do so, would fall a victim to his accuser."

"**ESCULENT VEGETABLES OF VAN DIEMEN'S LAND.**—However wild and uncultivated, and devoid of human inhabitants, any part of this globe may be, there is sure to be found, as soon as such a spot is visited by man, that provision has been made for his support, till he himself, by the means which art has taught him, can prepare his artificial nutriment. Nowhere is proof more abundantly given of this merciful provision for the wants of man, than has been made known to us by botanical researches into the indigenous esculent plants which are to be found in Van Diemen's Land. These are chiefly of the fern and orchis tribes. The Tara fern, which in appearance very strongly resembles the common brake of England, covers very extensive portions of open land, and varies in height according to the richness of the soil in which it grows. In some places it reaches to the height of a few inches only, in other and more congenial spots it arrives at a size so gigantic as to hide a man on horseback. The root creeps a few inches under the ground, and, when luxuriant, is about the thickness of a man's thumb. When turned up by the plough, the pigs eagerly devour it, and in light sandy soils they grub it up themselves. The aborigines roast it in ashes, and peeling off the outside black skin with their teeth, eat it as a sauce to their roasted kangaroo, in the same manner as Europeans eat bread. It possesses much nutritive matter, and yet those persons who have been obliged to use it in long excursions

through the bush, though they have supported life, became very weak and reduced. This may have arisen either from the parties resorting to it too late, or from being too exhausted to procure it in sufficient quantity, or from eating it raw.

"Great quantity of arrow-root may be procured from this root. When grated and reduced to a pulp by mixing it with cold water, the arrow-root is detached and sinks to the bottom of the vessel. By pouring off the floating pulp and water, and adding fresh water, stirring up the white powder, and again allowing it to settle, it may be easily prepared for use. It may then be cooked by boiling, or the powder may be spread on cloths and dried in the sun, or hung up in linen bags where there is a free circulation of air.

"The base of the inner leaves of the grass tree affords food also to the aborigines. The heads of these singular plants are beaten off by striking them about the top of the trunk with a large stick. The outer leaves are then stripped off, the inner leaves cut away, leaving about an inch and a half of the white tender portion adjoining the stem, (like our artichoke.) This portion is eaten both raw and roasted; the flavour is like that of a nut, and is also slightly balsamic. Other species of the grass tree are used in different parts of the colony. Small bulbs of the orchis tribe of plants, which are very numerous in the open and thinly wooded parts of Van Diemen's Land, are also eaten by the natives, and by cockatoos, kangaroos, rats, &c. Little holes often mark spots where the latter animals have been searching for them. One species, which springs from the decaying roots of the stringy bark, produces tubers, growing one out of the other, of the size and nearly the form of kidney potatoes. These are roasted and eaten by the natives, resemble beet-root in flavour, and are called in the colony 'native potatoes.' A species of fungus is often found, which reaches the size of a child's head; it is known by the name of *native bread*, and in taste resembles boiled rice. Like the heart of the tree fern and the native potato, cookery produces very little change in its character. It is found attached to a rotten tree. Another esculent fungus grows in clusters round the swollen portions of the branches of the myrtle in the western part of the island. It varies from the size of a marble to that of a walnut; when young, it is of a pale colour, and covered with a skin like that of a young potato; this skin is easily taken off, and the remaining portion when raw tastes like cold cow-heel.

"The esculent fruits of Van Diemen's Land which have hitherto been discovered are neither numerous nor to be compared to the

commonest English kinds; but, in proportion as civilization advances, suitable trees will be introduced, and will rival those of, at present, more favoured climes."

THE BANKSIAS, AND THEIR CULTURE.

THESE handsome hardwooded shrubs are from New South Wales and New Holland. The foliage is particularly beautiful and a good deal varied, which feature gives additional interest to a collection of the species and varieties. The soil in which these subjects thrive best in pot culture is, one-fourth peat earth, one-fourth sand, and half the loam of rotted turves; or if this loam cannot be had, one-fourth of clean loam, and one-fourth of clean vegetable mould, that is to say, rotted leaves; but the loam from rotted turves is superior to any thing. This soil should be well mixed, and run through a very coarse sieve, with half-inch meshes, so as to stop large stones and pieces of undecayed wood, and large tufts of roots, but not to stop ordinary stones, and the great portion of half-decomposed fibre, for that it is that renders peat earth so effective in all cases where light soil is required. The plants are to be placed in this soil in pots appropriate to the size of the roots. The pot should be first supplied with one-third of the depth in broken crocks, covering the holes with large ones, but laying hollow, and those above being smaller. The roots are to be spread out a little, and the whole pressed firmly but not hard, the collar of the root being fully as high or rather higher than otherwise, than it was before, that is to say, the roots are to be as near the surface as possible, and rather higher than lower than they previously stood. The best situation for the Banksia is a cool greenhouse, one in which no fire is necessary to keep out frost; smaller plants will do in cold frames, for they are very impatient of heat. Great care must be taken that they do not suffer for want of water, for where they are so well drained, and the soil of a nature to let the wet through rather rapidly, they require a good deal of attention. In all the shifts from small pots to larger, the rule as to the proper time must be, when the roots have reached the side of the pot, and begun to cross each other and met there; but it is not right to give too much pot room, unless you want to force the growth, which is by no means desirable with any plant that attains a large size naturally, because in this country it must be under glass, and the slower the growth, so that it be seasonable and healthy, the better. We do not mean that a plant should be absolutely stunted, but that no means should be taken to excite it. One shift a-year is plenty, and that should be when the

plant has had its rest, and is about to grow for the season. The larger the plants grow, the more care they require, and the watering must be especially attended to, for were they too dry for a very short time, they would hardly recover the shock.

RAISING FROM CUTTINGS.

It has been the custom to strike these in sand, but the pot should be filled within half-an-inch of the top with the soil the plant grew in, and the compost should be settled down, by striking the bottom of the pot against the potting table or bench; fill the remainder up with silver-sand, so that there will be half-an-inch of it in thickness. Now take cuttings of last year's wood, cut them at a joint two inches long when the plant has been at rest some time, take off the two or three lower leaves, so as to clear half-an-inch of the stem and no more. Insert these in the sand, which is to be prepared for their reception by being watered with a very fine rose, until it is completely saturated; you may then stick in the cuttings about an inch apart, so as to just touch the soil under the sand, all over the pot, except having just enough room round the edge to allow of a striking, or bell glass going over them all, and being pressed a little into the sand to exclude the air. When they are all stuck in, a very slight sprinkle of water, with the same fine rose on the watering-pot, will close the sand all round, and the glass may be put on and gently pressed, so that the edge may go into the sand. This should be placed in the coolest part of a hothouse, or in a propagating house, or a hot-bed that has declined in heat a good deal, but they must not be plunged, so as to get any bottom heat stronger than the ordinary atmosphere it is placed in. The glasses should be shaded with paper or thin cloth, and every morning they should be wiped inside. When the sand gets a little dry on the surface, it must be watered gently. In a few weeks the cuttings will strike root and begin to grow, but they must then have a little air for an hour in the evening after the sun is off, but be covered up and shaded during the heat of the sun. When the cuttings have evidently been growing a fortnight or three weeks, you may carefully examine them, by lifting some of the soil and sand with the blade of a knife, so as to lift one of the cuttings; and if they have rooted enough, prepare some forty-eight sized pots, one-third full of crocks and the rest soil, the cuttings to be carefully raised by something thrust under the roots, and remove them without damaging a single fibre. Let the roots be put under the surface and no more; none of the stem must be buried. Let the soil be pressed gently to the roots and afterwards be watered.

When they are all potted, they should be placed under hand-glasses in the propagating house or stove a day or two, and then be removed to the greenhouse, still covered with hand-glasses. They may, when established fully, be placed in a cold frame, or in the greenhouse, and from that time take their annual shifts, and be managed like regularly established plants in pots.

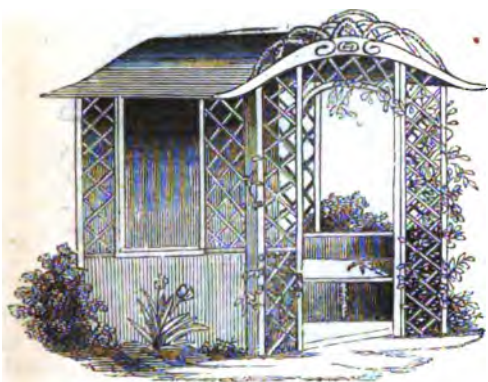
The *Banksia* is by no means showy in its bloom. It is as much like a thistle as any thing except itself, but instead of being prickly, all the small portions that in the thistle head are sharp points, are in the *Banksia* fleshy and coloured. All the flowers are a kind of burry sugar-loaf-formed mass, formed of a stamen-like substance, standing out from the upright pillar on which they are formed. The majority of them are yellow and yellowish green; but there is one, *coccinea*, which is red, and another, *littoralis*, which is orange. These are the only exceptions. The foliage is the principal beauty. The flowers may be called curious from their formation, and elegant from their structure. The *Proteas* are somewhat allied to them in the structure of the flowers, and in all respects require the same treatment.

RAISING FROM SEED.

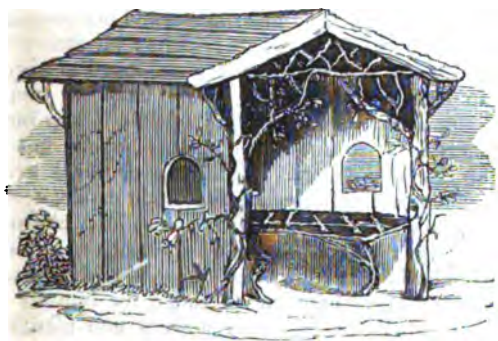
The seed may be sown in spring, in the same kind of soil that is recommended for their growth. Sow the seed thinly, and place the pots or pans in which they are sown in the open air in the shade, or in cold frames; when they have grown sufficiently to handle well give a good watering, and draw out the plants where they are thick, so as to leave the remainder an inch apart, and prick out those that are so drawn into other pots an inch apart; water, to settle the earth about their roots. The object of watering them well before drawing out the superfluous plants is, that when the soil is well wetted, the plants will draw easily without damaging their roots. Those which are left in the original pot or pan, must have the earth laid even, and a little water given to settle it down again. When the plants grow large enough to pretty nearly touch each other, they may be planted out, three or four in a pot of the forty-eight size; for they are less likely to damage for want of water where there is a body of mould, than when they are in small pots singly, and the increased distance gives them room to grow one more season. The third season they may be potted off one plant in the forty-eight sized pot, from which time their treatment becomes the same as that of established plants. They must be regularly protected always at the approach of winter, but they must have plenty of air, and no fire heat while it can be avoided.

GARDEN ARCHITECTURE.

THIS term may be applied to every description of building required or permitted in a garden, and there is no rule or limit by which



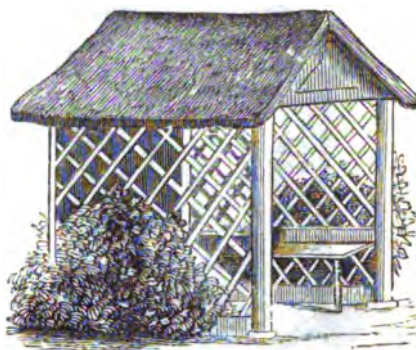
the fancy is at all fettered in those erections which are most commonly called summer houses, on account of their being open to the admission of air, and not furnished with doors. The sides may be trellis-work of any fashion, the roof weather-boarding, tarpaulin, thatch, or the so-much-used and much-belauded asphalte. And as to form, any one may adopt the shape which pleases him most, or fills the place allotted to it best, without laying himself open to criticism, so that he be consistent; that is to say, if it be rustic, let there be no part of the woodwork outside without the coating of bark; if it be fanciful, but with evident marks of the carpenter's finish about it, see that the whole is so, and no rustic features about it. Whether the house be circular, oval, oblong, square or angular, whether it be a ridge roof, a pointed, or an arched roof, is only a matter of taste, but there are some matters of convenience that must not be lost sight of. In the



first place, it should not be diminutive, for it is as well to be without one, as to have one useless on account of its inadequacy. In the

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next place, the weather should be shut out from the north and east points. The sketches which illustrate this article are not given as specimens of what should be, but of what has



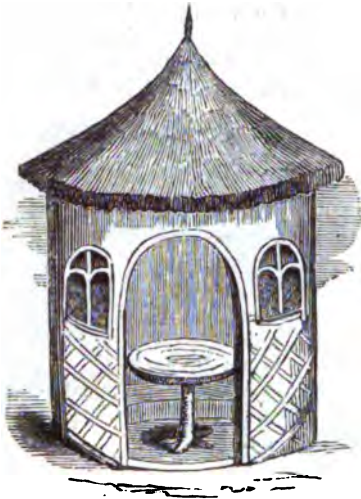
been, and is. They are specimens of the wild taste exhibited by people who were their own architects. There is a mixture of all styles, from the form of a common watch-box with an open front, to that of a tight, well-appointed, warm, close, temple-looking place, fit for a snug party to dine in. In looking at these specimens, there is one thing to remark; there is the precise mixture which we have condemned, a mixture of clean, finished carpentry, with the rustic. But the trellis-work can always be made with wood with its bark on, as well as with finished laths or quartering, and therefore the designs are as useful as if they had been all one or all the other. For utility, the sides should not be open work, or, if so constructed for the sake of appearance, an inner wall of rushes or straw, after the fashion of thatch or of matting, is necessary



to keep out the wind and weather, while the trellis outside, whether rustic or plain, may be preserved as a feature in the construction.

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Arbours are properly speaking only frames, over which trees and climbing plants, shrubs and such like are to be trained, and are per-



fectly useless in wet weather, for however well they are covered, they cannot be impervious to wet. Summer houses, on the contrary, have a sound roof, however open they may be on the sides and back. But in reality they are not summer houses, without they have the two sides and back weather proof by some means. There is one glaring inconsistency

in some erections, and of these we have given a specimen. Nothing can be so ludicrous as a house with trellis sides and regular glass windows. The sides ought to be solid, or the windows are out of place altogether.



However, by seeing what has been done, and in some very fine places too, it is easy to see what may be done to improve any of them. They should always be placed in a good site, where a pretty view of the garden may be seen, and where it would form a pretty object in itself; for nothing is more important than a good site.

KEEP DEALERS IN FLOWERS UP TO THE PROPER STANDARDS.

WE hardly know of any one subject that we could touch upon, that is of more importance than the necessity of attending to the above wholesome advice. The amateur gardener, and the owners of garden establishments, are directly interested in keeping up the standards of excellence. The dealers are short-sighted enough to believe that they are interested in lowering the standard. This, although a prevalent notion, and acted upon by a vast majority, can only serve them temporarily, while it destroys the emulation which alone sustains the science. The dealer who does not make the slightest advance in respect to the quality of new flowers, will, nevertheless, describe his novelties in glowing colours, and, if he can, induce enthusiasts to buy them; but in time enthusiasts get disgusted with the varieties so highly extolled, and find that they do not even approach the qualities required in a new flower, to justify its being named or sold at all. The purchaser should, therefore, make the dealer give a written guarantee as to the real qualities of the subject, and engage to take it back if it proves not to be what is said of it. Strange as it may seem, there is

not a dealer who has not been taken in himself, and then, as a matter of course, he has taken in others. A slight glance at the catalogue of the present year will tell, as well as anything, that there is a greater disposition than ever to keep in cultivation things that have been condemned by good florists, because they have been beaten by newer and better things in the same way. The catalogues teem with rejected, and properly rejected things. The newspapers and periodicals praise them in descriptive lists: all manner of means, fair and foul, are employed to give an artificial to things which have no real value; and, however reprehensible it may be, there is a continual war against buyers, kept up by the sellers. Hundreds of these are recommended in descriptive trade catalogues, as show-flowers, that have not a solitary claim, because they are the exploded varieties. The standards laid down for flowers and plants enable every amateur to judge for himself; and in all the tribes of flowers and plants there are a few that approach the necessary qualities, and are esteemed accordingly; while those manifestly deficient are altogether

put aside, among good florists. The efforts, then, of the dealers to keep their inferior things in cultivation, must be counteracted, and can only be combated by the buyers, who must insist on having none but such as the best florists will grow. So much for the established varieties; but as they are generally of moderate price, the evil is greatly increased in sending out new varieties, because the price is generally from five to ten times the amount of old ones; and nothing is more common than to send out new ones considerably worse in quality than those already in cultivation, described, however, as fine show-flowers, extolled in the newspapers and periodicals, and sold at a price that the very best alone are worth. This evil can only be cured by the buyers themselves positively refusing to buy any novelty that is not duly appreciated, and published as worthy, by an authority that they can rely on. But here there is a new danger awaiting them:—Which is the authority to be depended upon? For years the Metropolitan Society supplied the information required; no one who followed the dictation of that Society was deceived to any greater extent than the changes in the very constitution of seedlings will occasionally, but not often, bring about. When this Society's judgment was too severe for the supposed interests of the trade, and scarcely one new subject in twenty obtained its approval, some of the leading dealers set up a little judgment-place of their own. They associated themselves under the title of the Floricultural Society of London. As individual dealers, they had let out every year many worthless subjects at large prices; but as very few were in the list of the Metropolitan Society, the public in general were too cautious to buy to any great extent; and it was sought, by establishing the Floricultural Society of London, to report more favourably, and to assist in the sale of novelties. The Floricultural Society of London lived only two seasons. The dealers who announced individually in their catalogues twenty good things where there were not more than two, were not a whit more considerate when they reported in a body. The very first season was a trial of strength between Mr. Glenný, the secretary of the Metropolitan Society, and the association of dealers. What they reported first-class, he denounced as good for nothing. Without going into the question at all, we need only say, that when the season came, Mr. Glenný proved right—the Society's report false. We will not go into the question of whether the body of members were bad judges, or no judges, or that they wilfully misrepresented things; the facts, as they turned out, proved that the productions

were not as reported. Mr. Glenný's Almanack lists maintained their credit, and the London Floricultural Society ceased to be. It is not our business to record the manner in which the Society closed its affairs; we have simply to show that a society of dealers, who cannot describe things rightly in their own catalogues, were not one jot more correct when they reported in a body; and, unless controlled, it has always been so, and always will be so. The Metropolitan Society, which was very quiet all the time the other was carried on, resumed, on its rival's decline, and again formed a guide as a society, which Mr. Glenný had been individually. But there is no question that he was the controlling power among seedlings, because his dictum has been represented as offensive, when he has alone stood but against a flower that several have considered good enough; and he has been represented as overbearing, because he would not give way. Whether it has been so or not, we are unable to state; but for some years his list of novelties and of old favourites have been not only the guide of many of the best amateurs, but they have been copied into many of the publications, sometimes with, and at others without acknowledgment, and often with additions which destroyed their value. The great rage now seems to be, at least among dealers, to bring into cultivation again many of the discarded varieties in all the tribes; and by this means, among others, to lower the standard laid down by Mr. Glenný, in his *Properties of Flowers*. By familiarity with inferior subjects, that have been excluded from good collections, the eye will, it is thought, be less liable to be offended, if the novelties sold out at large prices prove worse than have of late been approved; and the means employed to carry out this retrograde movement are powerful, unless exposed. A newspaper, of which this department is done by a dealer who derives his information from other dealers, has been occupied for months in giving descriptive lists of show-flowers, into which lists those which have been discarded by good florists are placed with impunity, and sadly misrepresented. This, however, misleads but few, and alone utterly fails. But some of the dealers under the control of this paper have again associated themselves into a body, to report on new flowers; and here will be the danger of the public being again sacrificed by the report of dealers, whose direct interest, according to all previous notions, is to impose on the buyers,—to obtain large prices for worthless novelties; a practice which an inspection of their individual catalogues, with their own descriptions of their own novelties, for years, will show to have been universal.

And we have it from a highly respectable florist, who has abandoned one branch altogether—there has not been a season for years in which Mr. Glenny has not offended several florists, by not including in his list of worthy novelties something of theirs, which was not, in his opinion, worthy, and which he refused to recommend. We are not supposed here to defend Mr. Glenny as immaculate, but ample evidence exists that he has been nine times right for once wrong, although his lists comprise less than a tenth of the great number constantly recommended to the public in catalogues and newspapers; and when one or two hundred novelties are recommended as good things, worthy of cultivation, and at a high price, it is no small advantage to the public to be able to turn to a shilling almanack, and find the best dozen or score of the whole number mentioned as worth growing, at the high price; and even such of those twelve or score as are at all faulty described; so that the amateur may be guided accurately in his search of new subjects. We believe nobody has done justice to these lists; their true value to the buyers of novelties has never been appreciated; and we hardly know how to show their value, unless we take the instance of a new grower. Say a gentleman desires to become a cultivator of dahlias for show—any other flower would do as well; say carnation, for that is a favourite flower. He obtains a trade catalogue, and in this he finds between sixty and seventy *scarlet bizarres*, near sixty *pink or crimson bizarres*, more than fifty *scarlet-flakes*, close upon sixty *rose-flakes*, and near fifty *purple flakes*,—in all, very nearly three hundred varieties. There is not the smallest guide as to which are the best, for the price is no rule; that merely represents the scarcity, for some of the cheapest are the best. What is a gentleman unacquainted with the varieties to do in such a case? He would be mad to buy all; and if he orders less than all, and leaves it to the dealer to select, the dealer serves him with what he has most of. He makes the customer suit the stock, and the beginner is as likely as not to have two-thirds of his number second-rate or worthless. Let us turn to the almanack, and see how far he is aided by that annual work. Why, he finds all the best selected, and more than two hundred discarded. Upon these lists he may depend. Whether he selects a dozen, or the whole fifty, he cannot take a bad one. Glenny's "Properties of Flowers and Plants" has laid down the standard for the perfection of all the different flowers; and the lists which he has given, are confined to those varieties which come near enough to the standard to entitle them to the esteem of good florists; so that, without any other guide than these lists, the

amateur may safely select any number, from a single variety to the whole, and be sure of possessing nothing but varieties that deserve cultivation. But in the single fact which we have mentioned, (the trade lists not only containing the fifty or sixty good ones, but two hundred not worth having, and, therefore, not fit to buy,) we can observe the continued struggles of the dealers to force the sale of the worthless as well as the best, and so keep up the means of preying upon the young beginner. Picotees, which are becoming a very favourite flower, and well deserving cultivation, exhibit just the same features in the catalogue. In rather a limited trade list, we find no less than sixty-three purple-edged, close upon eighty red-edged, and near thirty rose and scarlet-edged. Who can select from these, twenty or thirty sorts to begin with? Nobody but those well acquainted with their qualities. Here something approaching two hundred, without any distinguishing marks by which the quality can be judged, are placed before the purchaser: neither the price, the name, nor the colour, can give him the slightest idea of the quality; and he must either turn to some authority for his guidance, or trust to the tradesman, who, we are quite sure, would not give him the best; because, if he did not mean to push the worthless ones, he would not publish them; and it is only among those who know no better, that they can be made to go off. The annual almanack list, however, contains none but the good ones; consequently, the number is reduced to fifty, among which the amateur cannot find one unworthy of his notice. Let us take pinks; and in all the trade catalogues, we find from one hundred and sixty to two hundred: these he has reduced to a fourth, and of this number not one is unworthy of the florist's care. The other three-fourths being too much below the standard laid down, are grown only to force upon the unwary, and kept in cultivation that the standard of new ones may be reduced in the same proportion. The amateur has, therefore, only one line to pursue: he must refuse every thing that does not come near enough to the standard to be placed in the annual lists, and altogether abstain from the purchase of novelties, however highly recommended by the trade, individually or collectively; for we could place before them the names of flowers recommended and advertised by the most respectable as well as by the most imposing of the dealers as first-rate show-flowers, but which proved not worth growing at a gift, to say nothing of paying for.

At this time there is more than usual energy displayed by dealers in their efforts to force trade, and there is required more than usual

caution on the part of buyers to meet the temptation. In this city and neighbourhood we have treated Glenny's Garden Almanac as our guide for new things, and we also buy sparingly from this in some things, because, although he mentions even this season twenty-four dahlias, he describes all their peculiarities, and one half will not be bought here, because we know by the faults he mentions, that although he has selected only twenty-four or five out of the hundred or two so strongly recommended, even these twenty-five are so fairly described, that he who can only buy six, may make his selection. It is also clear from the introduction to these twenty-five, that the writer does not really admire one-half. Then let us look to the general catalogue of Dahlias: the first we have laid our hands on contains three hundred and thirty. This year there are hundreds of persons going to begin cultivating; we have many even round Dublin, where the very idea of having to select a few from three hundred and thirty, would deter any man, unless he had some guide for his selection. Let us turn to the almanac and see about forty or fifty of the best only, with their colours attached, and our task is made easy. All those which are worth an amateur's or even a tradesman's notice are mentioned in the list, and the fancy flowers, of which the Foreign catalogues contain hundreds, are reduced to the few which are worthy of a place among our best collections. And why are the trade catalogues made to contain the three hundred worthless varieties as well as the sixty better ones? Because, by lowering the average quality of those in general cultivation, new ones are tolerated of a much lower average quality. We have carefully read over the descriptions of the twenty-five mentioned in the almanac, and we conclude from their descriptions, that unless it be *DELIGHT*, of the certainty or uncertainty of which he is doubtful, there is not one of the whole number comes up to the standard of perfection. Sir Robert Sale, *Scarlet Gem*, or *Yellow Standard*—the descriptions speak for themselves; the writer has been candid, too candid to be pleasant to the growers. It is obvious that *Gem* and *Shylock* are inferior to those we mention; *Shylock* is not of the standard of perfection school; it is of the old school. The outline is not circular, the petals are coarse, the flower open; but its constancy is likely to overcome all difficulties: like the *Essex Triumph*, its constancy and high centre make up for its coarseness and bad outline. But let us take the descriptions of the authorities quoted by the vendors of *Shylock*—they are favourable without criticism; they speak of its pre-eminence, and of its being shown in first-rate style; neither of the authorities

quoted, however, being of any standing. Mr. Glenny's description of it is not to be misunderstood; he says,—

"*Shylock*, a dark red or scarlet, apparently very constant, rather coarse, large petals, and outline not perfect, but general form good and centre well up."

Those who know the standard of perfection for a *Dahlia*, will see from this description the points which are deficient, viz. the outline not circular, and the want of doubleness, but the general form, the high centre unexceptionable. The coarseness of the petals is the fault when the *dahlia* is not sufficiently double, because there ought to be less of each petal seen: there should be two, when there is only one. We only mention this to show that there is nothing more important to the amateur than keeping dealers up to the standards in any flower, and by no means to buy at any uncertainty. *Gem* is mentioned in much the same way; the general form good, but not made up of good materials, the petals coarse, outline not round; these two defects throw the *dahlia* back half a century. But we are not going to waste too much space on one flower. Turn we to the *Pansy*, and there is a list of nearly two hundred, of course all, and it is positively asserted that there are not one-tenth that contain such properties as to entitle them to places in a grower's garden. We do not deny that hundreds may have had prizes, but scarcely one in ten has deserved them. Of the list mentioned in the almanac, many are deficient in quality; but although the *Pansy* made rapid progress at one time, there is a great laxity on the part of judges in deciding upon the claims of new sorts, and many are sent forth to the world which have a positive defect, so pointed as to render them worthless to an exhibitor. One half—we are now speaking within bounds—one half of the best sorts in this country have too small a centre, and the rays of the eye touch the border. It is quite time the judges disqualified stands of flowers for a single defect of this damning kind: there is no fault so disgusting, unless it be the hare lip or notch in the under petal. Many persons send a post-office order to a *Pansy* dealer, and tell him to send them a little collection; they might as well put their money in the fire. Let anybody who orders a thing name it himself; better had he name at random than trust to what a man's stock will afford him, for that is exactly what he gets if he does not mention the sorts. There has been equally great pains taken to get rid of the standard of excellence for *Pansies*, as there has been to lower the standard for other flowers. It is a constant struggle between right and wrong, a continued running fight between the approvers of the "*Pro-*

perties of Flowers and Plants," and the dealers who find them prejudicial to their present interests, or who fancy them to be so, for we are quite sure on this side the channel that hundreds are deterred from growing flowers, only on account of the certainty of all their first purchases being a waste of money. This would not be the case if the growers would at once cease to propagate worthless subjects, and introduce no unworthy novelties. The first few amateurs that start with the best Pansies only, and confine themselves to the varieties that have good centres of white or yellow eyes that do not radiate into the border, smooth and round outline, and thick petals free from notches, will not fail to beat the larger growers by the brilliance of their stands and collections. Perhaps there never was a season in which the dealers felt more the want of confidence in the buyers than they do and will at the present period. The journals are not to be relied upon. The catalogues, instead of being diminished, are increased: not one of the dealers whose lists have been forwarded to this country, exhibits any falling off in the number or character of the flowers they recommend; their name is Legion, their description flattering, and were it not that we can get the annual monitor, and make it last us from one season to the other, we should be apt to abandon floriculture altogether. There is one flower that we have not been favoured with a list of in the almanac, and it is more than any other the means of drawing the public of money for nothing like an adequate return. The truth is, that there is no breaking in upon the close phalanx of dealers who form the trade. Rose catalogues contain from five hundred to one thousand varieties. It was once positively affirmed in the Gardener's Gazette, that there were not fifty that came near the standard, and not a hundred that there was the least excuse for cultivating. Now, we would defy the best judge in the world to select from the catalogues any number with any chance of making a good choice. There is nothing to guide him; hundreds are falsely said to be good show flowers. Attend the most extensive exhibition of this fine flower, and the difficulty of picking out a score that are worthy of a place will be too great to overcome. Nobody has ever succeeded in doing so. We do not mean that nobody has ever noted down even twice as many; for there is neither taste nor information enough among the mere butterfly visitors to discriminate between a good form and a bad one, between a thick petal and a thin one, between a smooth edge and a rough one. Many there are, male and female, who have no other notion of a rose than its colour: they have eyes void of order; they have no idea of

symmetry, no sound judgment as to the construction of a variety, and they note down whatever looks gaudy, or large, or strange; but the highest qualities will prevail among people of common sense, who are not blind followers of fashionable frivolities, and who therefore exercise some discretion even in the picking of a flower. The properties of the rose are well defined, but there are two or three points that everybody ought to keep up to before they add one variety to the garden. A rose ought to be perfectly double to the centre; the petals ought to be very thick and smooth; for unless they are thick they last no time in bloom, and are no sooner in flower than they are out again. But if a grower shows a collection of one hundred, you will scarcely see a dozen sorts as good as the old Cabbage Rose, the Provence, the Moss, and the double yellow. Not a dozen, do we say? not half a dozen. And why have the public been surfeited with varieties actually worse than we had half a century ago? Nobody can be too severe in selecting them: we wish it had happened that the Garden Almanac had mentioned a list of roses as well as other subjects, but we find it will next year. We have seen one list of the best roses, published by Paul and Sons, and we can only account for such a list by the fact that they are dealers; but if the public will not exert themselves to exclude the worthless, the dealers never will. The Fuchsia is a plant that has had its day of imposition; thousands have been sent out, hundreds still occupy catalogues that ought to be sent to the dunghill. The abominable ugliness, the sameness, the faults are so conspicuous that we wonder any body bought them in bloom; and the impositions have been so gross, that we still more wonder how any body could think of buying them out of bloom. The five hundred in cultivation do not boast of thirty-six good ones, and we turn with profit to the list of twenty-four, which comprise all that anybody need care for, old or new. It would be hardly worth pursuing this subject, further than to impress on the mind the necessity of looking well to authorized lists; and when buying any thing in flower, look well to the standards laid down. There cannot be too watchful a look out, where a whole race of dealers are trying to outwit all the young, and many of the inconsiderate, amateur growers. The fact of publishing the hundreds of names of things good for nothing, along with the score or two of things really worth growing, shows the object. The manner in which this is upheld by descriptive lists in the periodicals, shows that the public have nothing to hope from the press. They cannot, therefore, too carefully look to themselves; and if they are not perfectly satisfied that a

novelty is worth their money, they should clearly abstain from buying it till it has been one year out, when they can get it for an eighth of the price.—B. A., *Dublin*.

GENERA, SPECIES, AND HYBRIDS.

HYBRIDIZING! never was a word so misapplied, because it is used for any cross among the same species; whereas, strictly speaking, it means the same as muling in animals; and we are told that, in cases of real crossing of species in animals, such as the horse and the ass, the progeny is barren, which in the so-called hybrids among flowers is not the case. The mis-called hybrid rhododendrons, azaleas, amaryllis, and many, if not all others, bear their seed as well as the very best and commonest of plants. If we use the word hybrid to mean the crossing of a breed, such as a white dahlia with a red one, or a cucumber with a melon, or a cabbage with a cauliflower, we can perfectly understand it; but, strictly speaking, a hybrid should be such a crossing of two species as shall prevent the progeny from bearing seed. We wish to call especial attention to the difference between hybrids and mere seedling varieties, and again, to the indiscriminate practice of making any foreigner, no matter what, a different species, although it is clear from the most casual inspection that nine-tenths of the so-called species are merely seedling varieties; and when they are cultivated here, and get into the hands of florists, far greater distinctions are found in the plants raised from seed than in the so-called species imported. The words hybrid and hybridising, as now used, mean simply crossing the seed of two plants, unlike each other, but of the same family. For instance, the azaleas and rhododendrons may be considered as unlike each other as most things, yet they breed freely; and Mr. Smith of Norbiton produced yellow rhododendrons by crossing the rhododendron with the yellow azalea. This is a great advance, because the plants are very far from like each other; but it has been doubted whether the specimens produced were from the azalea, because there is a yellow rhododendron, called *R. chrysanthum* or *R. officinale*, from Siberia, and it is thought a good deal more likely to be a cross from this. The rose family have been crossed so much that the florists are producing some very fine things, among, it is true, a good deal of rubbish; and the only thing to be regretted is, that the cupidity of dealers has introduced twenty worthless novelties for one good one; otherwise there are now some magnificent seedling varieties of the rose, and the affection of classing them is rapidly wearing out; for although the catalogues still have them in

sections, the public find that there are similar flowers in many of the classes, and that the distinction which consigns a rose to a particular section is so slight, that the growers differ as to which it belongs to, and the public cannot discover it at all. There seems to be some reason for calling a cross between the melon and cucumber a hybrid, because they are so much opposed in flower and form; but even hybrids from these bear seed, so that we must altogether repudiate the idea that the produce of a mule plant is barren. It seems, indeed, nothing but fair that a deciduous plant and an evergreen should be considered distinct species; but if Mr. Smith's azalea and rhododendron produced the fine yellow varieties exhibited by him, and which seed freely, there is an end of the notion that mule plants are barren.

GARDENING MEMORANDA FOR OCTOBER.*

Now comes the season for alterations, making new beds, walks, clumps, and general changes; the removal and planting of trees, shrubs, and plants of all sorts; the making of box edgings, pruning of roses and all kinds of shrubs, wall fruit trees, and, though but little attention is paid to it, the standard trees in the orchard. The principle of pruning, though not of the training adopted for trees on walls, should also be adopted in standards; that is, cutting away useless, weak shoots, and also removing branches that grow in the way of others better placed; especially also should all trees be kept within reasonable limits. Instead of allowing them to grow towering up, with long branches that no ladder can reach, let them be cut down, and the whole trees be properly trimmed out. All newly planted trees and shrubs should be secured with stakes, lest the wind disturb them. In removing trees, &c. from nurseries, or from one place to another, all the roots should be brought away with as little damage as possible, and before planting, all the bruised and ragged portions must be cut off smooth with a sharp knife. Every thing should be planted with the collar of the plant close up to the surface; nothing is more likely to spoil any subject than planting it deep: all tap roots, that is, roots that go directly downwards, should be cut off; it is not right to encourage such growth in any soil. The improvement of estates, gardens, plantations, parks, and the grounds round a mansion, should be entered upon now earnestly by every one who has a regard for the permanent beauty of a place. The judicious felling of useless trees that are in the

* A very elaborate and complete Calendar of Gardening Operations for October is published in No. 34 of the Horticultural Magazine.

way, and the tasteful planting of a few clumps and specimens, will often so change a place for the better as to be hardly credible. All the falling leaves all over a place should be swept up carefully and removed to a heap, where they may be ready for use as a fermenting material for making hot-beds or to rot into mould, which is valuable, as there is not a more useful thing in the garden economy than vegetable mould. Lawns, and flower gardens, and shrubberies in general, should be kept clean, for everything gets foul and dirty at the fall of the leaf. The conservatory may be supplied with many flowering plants in pots; some of the plants for forcing may be taken to the greenhouse for a short time before going into the forcing house or the stove. The greenhouse is to be kept dry. Dahlias should be dug and stored away after

a day or two drying; seeds of all kinds, gathered and being gathered, should be well dried before they are put away, and all the plants in the pots kept rather dry than otherwise.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING OCTOBER.

The Greenhouse.—From sixty to sixty-five degrees by day, and about forty-five at night.

The Conservatory.—From sixty to sixty-five degrees by day, and about fifty degrees at night.

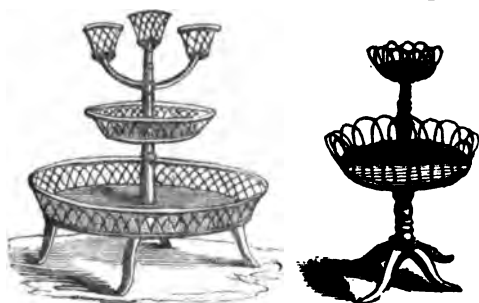
The Plant-Stove.—From sixty-five to seventy-five degrees by day, and fifty-five to sixty degrees by night.

The Orchid-House.—The warm or Indian house, eighty degrees by day, and at night seventy degrees. The cool or Mexican house, seventy degrees by day, and sixty degrees by night.

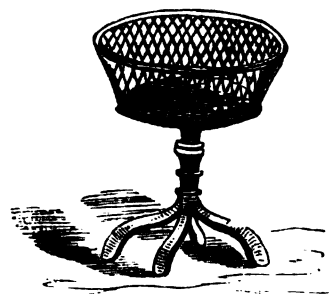
ORNAMENTAL FLOWER STANDS.

Those who admire flowers in the hall or in the drawing room, should always provide such stands as will enable them to keep the

number of plants which they are to accommodate. There is good room to exercise a little taste upon the subject. When the stand is



pots without pans, for the water in a pan is ruin to all plants standing in them, and this can easily be proved by reference to the thousands and tens of thousands that are killed daily, in all the manufacturing towns and populous cities in the empire. They are watered by filling the pans. This water is soon mischievous, because the roots are easily rotted by stagnant moisture. The stands for flower-pots should therefore be provided with a receptacle for the superabundant moisture, for it is impossible to prevent water from running through the pots. This receptacle may be a groove round the outside, or near the outside of the solid bottom, forming a gutter into which the surplus moisture might run, and from which it is easily taken up by a sponge. The bottom must of course slope towards the outside, or have grooves or gutters leading from the centre to the outside. This does away with the necessity of using pans, and the danger of injuring the plants by stagnant water. With regard to the form of these stands, they may be various, according to the places they are to occupy, and the



for a single pot, there must be a sort of cup for it to stand over; not to stand in, so as to touch the water, because that would be as bad as a pan. These stands require to be emptied occasionally, because every time the plants are watered, some would go into the gutters, which, if not attended to, would overflow. These stands are made variously of iron or wicker, as the case may be, and may be had of almost any form, in wood of the rustic seat makers and verandah builders, and in iron



from the general wire-workers. Some are cast, but, rich as they look, they are not adapted to move up and down or about a house.



HOYA IMPERIALIS.

Hoya imperialis, Lindley (imperial Hoya).

—Asclepiadaceæ § Stapeliæ.

This is certainly the finest species of *Hoya* at present known to exist: it bears an imperial aspect. "Imagine," writes Dr. Lindley, when first describing the plant, "a true *Hoya* with woolly stems, leaves six inches long, and clusters of the most magnificent flowers forming a diadem of ten rays, each flower fully three inches in diameter, and with the delicate texture of the common *Hoya carnosæ*, and some idea may be had of this superb species." For it, our gardens are indebted to Mr. Hugh Low, Jun. by whom it was sent from Borneo, to Mr. Low, Nurseryman, of Upper Clapton. It bloomed for the first time in England in the summer of 1848, when a fine plant, just beginning to unfold its blossoms, was exhibited at one of the grand floral fetes of the Royal Botanic Society of London, at the garden in the Regent's Park, by Messrs. Lucombe, Pince, and Co. of Exeter.

The plant is a strong growing climber, extending itself rapidly. The branches are rounded, of a dark green colour, and clothed

with short down. The leaves are opposite, from six to nine inches long, obovate-lanceolate in figure, having a glossy surface, thick and leathery in texture, and in colour dark green above and paler beneath; they are connected with the branches by means of a short thick downy footstalk. The flowers grow in extra-axillary umbels on long pendent peduncles, which are usually longer than the leaves, each peduncle supporting from nine to fourteen blossoms. The individual blossoms are large, being three inches across, the corolla rotate, of a pale purplish colour, and downy, within of a rich purple brown and glossy, paler towards the centre, the fine spreading segments being of a cordate-triangular figure. In the centre is the large projecting staminal crown, of fleshy consistence, and having a glossy surface, and an ivory white colour; the contrast of these two colours in the flowers produces a very fine effect. In the case of Mr. Pince's plant, the blossoms were borne in June, but a plant of this habit would no doubt go on flowering for several months.

In a letter dated Sarawak, January 12, 1846, Mr. Low, Jun. describes having found this plant in the territory of the Gumbang Dyaks, where it formed an epiphytal climber, growing from the decayed part of a tree overhanging the river. There was, he says, but an individual plant. Mr. Low also mentions that the stem abounds in a white, perhaps acrid juice; which juice Mr. Pince observes to harden almost directly after being taken from the plant, and to flow so copiously from the wounded bark, that he cannot help think-

ing it may be found available for some useful purpose.

In the *Botanical Magazine*, where there is a fine drawing of the plant, from which our figure is copied, Sir W. J. Hooker gives the following particulars, from a letter by Mr. Pince of Exeter, describing his experience in the management of the plant:—"Hoya imperialis requires a strong rich soil, in order properly to bring out its numerous large thick flower-trusses, which are produced from different parts of its twining stem. We have used a compost of equal parts of loam, rotten leaves, and peat, with some *flakes* of dry, *half decayed* dung intermixed, and a liberal supply of sand and broken crocks blended with the whole. The plant which we exhibited was trained around a low circular trellis not more than three feet in height, and independently of the expanded truss there were several others in different stages upon it. We have also one planted in a corner of the stove, which is twining round a single wire over the path, and upon this there are trusses having eleven flowers on each. This I think

will be found the best method of treating it, for with its long pendent bunches of large flowers overhead, it is a most striking object. Each individual flower lasts a very long time in bloom, and is highly fragrant in the evening, and all the night." It seems a free flowering species.

We can add but little to Mr. Pince's remarks on the treatment of the plant. Being naturally (according to Mr. Low's observation) an epiphyte, the soil in which it is planted should be light and porous in texture, though rich in the elements of vegetable growth; leaf mould and rough flakes of half decayed dung are therefore excellent ingredients in the compost for it. It of course requires a stove temperature, and a moist atmosphere, such as is usually maintained in structures devoted to tropical plants.

Propagation of this plant may be effected by means of cuttings, planted in sand, and kept where there is a slight degree of bottom heat: they should be kept covered by bell glasses or hand glasses, from which the condensed moisture should be occasionally removed.

THE AMARYLLIS.

THIS gorgeous family of plants is very extensive, and the number of seedling varieties raised in England fairly distance many of the distinct species. They completely defy description, unless we were prepared to occupy a volume; but our immediate object is to mention a few of the species that have attracted most attention, and to give the outline of an effective system of culture.

- Aulica, green and scarlet, Brazils, stove.
- A. platypetala, orange, Brazils, stove.
- Crocata, vermilion, Brazils, stove.
- Equestris, scarlet, West Indies, stove.
- E. major, scarlet, West Indies, stove.
- E. plena, scarlet, West Indies, stove.
- Forbesii, purple and white, Cape, greenhouse.
- F. purpurea, purple, Cape, greenhouse.
- Formosissima, crimson, North America, greenhouse.
- Fulgida, vermilion, Brazil, stove.
- Kermesina, carmine, Brazil, stove.
- Pallascens, purple and red, Cape, stove.
- Principis, scarlet, Brazil, stove.
- Psittacina, green and scarlet, Brazil, stove.
- Pudica, pink, Cape, greenhouse.
- Regina, scarlet, America, stove.
- Reticulata, scarlet, Brazil, stove.
- Retinervia, scarlet, West Indies, stove.
- Rutila, scarlet, Brazil, stove.
- Striatifolia, purple, Brazil, stove.
- Stylosa or Maranensis, red, Maranham, stove.
- Subbarbata, scarlet, Brazil, stove.
- Variabilis, red and white, Cape, stove.

Vittata, striped, Cape, greenhouse.

V. major, striped, Cape, greenhouse.

As we have before remarked, the hybrid varieties as they are called, but in fact merely seedlings from these and others, crossed, are ten times as numerous, and many of them very beautiful. The difficulty we have in naming these, arises from the same fact which prevents our naming seedling Rhododendrons and other subjects, which have been crossed from the same parents, but by many different people, each of whom has given arbitrary names, and therefore the same thing, or something very nearly allied, has been cultivated under different names. The only way to cultivate these subjects profitably and pleasantly, is to see every one in flower before it is purchased, for many are too nearly alike to be worth growing side by side, and they are by no means cheap enough to buy in quantity and throw away the worst. There is no subject more easily cultivated. They require a soil formed of turfy peat, rich loam, decayed cow dung, and sand, in equal parts, well mixed, and run through a coarse sieve. Let the pots be well drained, and the bulbs planted only half way down the large part. But we recommend them to be bought in bloom, and to be kept growing after the bloom is over until the stem begins to decay, when you may cease watering them, and let them take their chance on a shelf in the cool part of the stove till the leaves decay. They are frequently taken out of the pots and laid on the shelf to

dry, but if they have no water in the pot, they take less harm in the soil. In the spring they may be taken out of the pots, the earth shaken out, the decayed roots but not the healthy ones pulled off, repotted in the compost we have mentioned, and placed in the stove. The greenhouse species will bear the stove as well as the others, but if there be a succession wanted instead of a general bloom, they may be placed in the coolest part of the stove or the warmest part of the greenhouse, and a few at a time be placed in a hotbed, or plunged in the tan of the stove up to the rim of the pots; as these rise for bloom, a few more may be brought in, or, if in already, plunged in the tan, to come forward in succession. They require constant watering from the time the bloom sheath rises, and they may all be brought forward in due season; for when they have once come into a habit of blooming, they rarely miss a season. With many persons they do not flower well, but the cause is in the carelessness with which they are treated after the bloom declines. They are neglected from that instant, instead of being kept in a growing state, for the bloom of one season is no sooner over than the plant begins to provide for the next; and if they are cut off from growing by neglect before the next year's bloom is complete in the bulb, the plant will have to grow all the next season to do what it ought to have done before it rested for the winter. The *Amaryllis formosissima* is one of the best forcing flowers for the spring, because it forms an admirable contrast to all the colours of hyacinths, irises, narcissuses, crocuses, and other spring flowers. The colour is rich dark crimson. These only require to be potted as we have directed, and placed in a common cucumber frame, or hot-bed made up on purpose. They do not grow higher than eight or nine inches. The flower is unlike all the tribe. If grown in the greenhouse it will not flower till July, but it may be used to earlier flowering every year, until it can be got to bloom among the earliest spring bulbs. These, like the others, must be allowed to complete their growth after the bloom is over, and have their rest in the same way. If any one desire to commence growing these beautiful subjects, and cannot or will not wait to see them in flower, their order should be for such only as are bright and distinct in colour, very distinct from each other, broad in the petals, or rather in the divisions of the single petal of which they are formed, and with large blooms. The order should also be for blooming bulbs.

SEEDLING AMARYLLIS.

Sowing the seeds of any bulbous-rooted plant is lost time, unless you can depend on

the quality of the seed, and there is no easy method of doing this unless you save it yourself. If any of those you bloom take your fancy as to form and brilliance of colour, select some one totally different, and with the anthers of each, as soon as the pollen has perfected itself and hangs on in yellow powder, and the pistil is covered with a gummy substance, impregnate the other, and by thus crossing from good parents you are not likely to have a bad progeny. Let the seed pods swell; keep both plants where the sun will reach them, and let them have a little air whenever you have an opportunity. When the pods are ripened, and are turning yellow or brown, gather the seed, and keep it till the spring, when it may be sown thinly in a flat seed pan filled with the compost we have mentioned, and placed in the stove. Let the seed be covered well, but no more, and keep the soil moist until they come up. They are to be kept growing, and be occasionally moistened, and if necessary weeded, for no weeds must be allowed to deprive them of room and nourishment. Here they may grow until the leaves decay, when they may be carefully taken up from the soil in which they are growing, and after remaining out of the ground a week or two, they may be replanted in similar pans or wide-mouthed pots an inch and a half apart, or in small pots, half-a-dozen in a pot, or any way that is most convenient, except that they must not be nearer than an inch and a half apart. They may now be placed in the stove again in the light, and with a moderate degree of moisture they will soon commence growing again, and may be kept in a growing state the whole season, until they again lose their leaves. Once or twice during the period of their growth the soil may be stirred a little on the surface, to give air to the roots, for the constant watering will run the earth together on the surface, and the breaking of this surface is like hoeing between crops. The second time the leaves die down, the bulbs will have swelled to a good size, and they may lie out of the ground on a dry shelf some weeks without drying too much. The next time of planting they must have still more room. Whether they are planted in forty-eight sized pots three in a pot, or larger ones more in a pot, or in pans holding still more, they ought to have full two inches distance between them. They have still to be treated the same; kept growing hard, the earth occasionally stirred, and the bulbs not disturbed till the foliage has died down again. When they have been taken up and had a rest out of ground, they may the next season be potted one in a pot, size large sixty, and each year the size increased until they bloom. There will be many no better

than the parents, many not so good, but none should be marked for keeping that have not some new or very good feature to justify it. The bad or indifferent ones may be got rid of, as most worthless things are, by a sale to some nurseryman who sends things to the sales by auction at the mart and elsewhere,

because there is no possibility of telling by the bulb what the flower has been, and there are always plenty of buyers. But the raiser of seedlings should never keep a second-rate thing, for the object is to improve, and all that are not improvements are worthless, and to be regarded as incumbrances.

CHOICE ROSES, WITH THEIR SEVERAL PROPERTIES.

As this is the time of year for choosing and planting roses, we subjoin a list in which they are only divided into two classes, though selected from all the families. One of the classes consists of those which are large enough and double enough to show single



blossoms in a stand: the other consists of smaller varieties, some bunches of bloom, others individual flowers, but the whole may be calculated upon as the best of more than fifteen hundred that have appeared in various catalogues. The list is from the forthcoming volume of *Glenny's Garden Almanac*.

HANDSOME BLOOMS TO SHOW SINGLY.

La Volupté, deep rose, very perfect.
Pashot, light crimson, fine.
Princess Clementine, pure white, very large.
Rose Devigne, pale pink, good form.
Superb Striped Unique, white striped with pink.
La Ville de Bruxelles, bright rose, glossy foliage.
Madame Zoutman, creamy white, large and double.
Semiramis, rose, fawn-coloured centre.
Boule de Nanteuil, crimson purple, very large.

Briseis, bright rose, large, good form.
Columella, rosy blush, very fine.
Cyntic, pale rose, very double, fine.
D'Aguesseau, brilliant crimson, perfect.
Duc de Valmy, brilliant rose, perfect.
Grandissima, brilliant crimson, fine.
Guerin's Gift, bright rose, very good.
Julie, rosy, very large.
Kean, a splendid scarlet.
La Tour d'Auvergne, fine large crimson.
Madame Henriette, brilliant rose, large and fine.
Brennus, noble large crimson, good form.
Marjolin, slate colour, large and very double.
Nelly, blush tinged with fawn, very fine.
Du Petit-Thouars, vivid crimson, striking.
Edouard Desfosses, bright rose, large and fine.
Lady Canning, rosy lilac, fine.
Le Marechal du Palais, delicate rose, very fine.
Proserpine, dark crimson, very noble.
Souvenir de la Malmaison, creamy white and fawn.
Cloth of Gold, large pale yellow.
Solfaterre, bright sulphur, large and fine.
Crimson Superbe, crimson purple, fine.
Devoniensis, creamy white, very noble.
Duchesse de Rohan, rosy crimson.

ROSES OF DIFFERENT GROWTH TO SHOW IN BUNCHES.

Blancheffeur, French white, good form.
Comtesse Plater, cream tinged with fawn.
Duchess of Kent, pale rose, very fine and delicate.
Hypacia, bright red, spotted, very striking.
Madame l'Abbey, brilliant rose, very fine.
Pompon de Laqueue, blush shaded, fine.
Crivalis, brilliant rose, very fine.
Duc de Trevis, fine rich velvet crimson.
Cillet Parfait, white striped with crimson, good.
Souchette, deep pink, good form.
Comtesse de Lapepède, silvery blush, perfect.
Fulgens, scarlet, very brilliant.
General Allard, rosy red, very fine.
Hybrid Stadtholder, light crimson, pretty.
Jenny, deep rosy lilac, fine.
Leopold de Bauffremont, delicate rose, good.
Madame Plantier, pure white, very beautiful.
Pompon Carmine, brilliant red, striking.

Charles Duval, bright rose, large and fine.
 Aubernon, brilliant crimson, good.
 Clementine Duval, bright rose, very beautiful.
 La Renoncule, purplish red, very perfect.
 Marquis of Boccella, pale blush, pretty.
 Melanie Cornu, crimson purple, pretty.
 Prince of Wales, lilac rose, very striking.
 Robin, rosy pink, pretty.
 Bouquet de Flora, deep carmine, fine.
 Ceres, deep rose, perfect.
 Desgaches, bright rose, very pretty.
 George Cuvier, brilliant carmine, fine.
 Gloire de Paris, deep crimson.
 La Camée, very delicate rose.
 Madame Angelina, creamy fawn, very beautiful.
 Madame Aubis, brilliant rose, fine.
 Pourpre (Fafait), crimson purple.
 Queen, fawn-coloured rose, fine.
 Reine de Congrès, pale blush, very delicate.
 Bernard, fine pink, excellent.
 Persian Yellow, deep yellow, fine.

These are all in addition to the fine varieties raised by Willison and Burgess, mentioned last year; and these are to be taken, not as perfect, because there are not half so many perfect, but they have all redeeming points in the present state of the rose as a show flower; and we understand this flower is to be taken up in earnest in the Almanac, to shorten the present trade lists, which are beyond all reason crowded with worthless sorts.

Connected with this subject, we are happy to notice a catalogue put forth by Messrs. Haslam, of the Epping nurseries, founded on the plan we recommended last year. Abandoning the ridiculous distinctions of the so-called rose nurseries, and adopting a mode of classification that everybody can understand, we are informed that he has selected about three hundred from upwards of 2,000 now published in the various catalogues of the continent and of England, and placed them as we suggested—Moss, Smooth Wooded, Rough Wooded, and blooming in bunches, such as Noisettes. Then we have some of the more particular kinds, from which very few are selected. The catalogue is divided as follows:

BLOOMING IN MAY, JUNE, AND JULY.
 MOSS ROSES.

A Feuilles Pourpre, bright dark red.
 Alice Leroy, pale lilac pink, fine.
 Blush, pale blush pink.
 Brilliant, bright pink.
 Celina, superb bright crimson.
 Crimson, bright crimson.
 Cristata, crested Provence.

De Meaux, blush.
 D'Orleans, bright rosy red.
 Eclatante, fine rose.
 Emperor, brilliant crimson.
 Grandiflora, large rose veined.
 Hortensia, bright rosy crimson.
 Josephine, rose.
 Lancel, crimson rose, very mossy.
 Lanseur, dark rose-striped lilac.
 Louise Colet, fine rose, cupped.
 Luxembourg, deep red tinged purple.
 Malvina, delicate lilac rose.
 Mousse Partout, rose, foliage covered with moss.
 Mousse presque Partout, very double rose.
 Mrs. Wood, dark rose, tinged purple.
 Perpetual Red, dark rosy crimson.
 Pomponne, pale blush.
 Pourpre de Laffay, purplish red.
 Princess Adelaide, delicate rosy pink.
 Prolifère, rosy red mottled.
 Prolific, fine rose, distinct.
 Sage Leaved, bright rose, fine.
 Splendens, light glossy rose.
 Unique de Provence, superb pure white.
 White Bath, paper white, large and full.

SMOOTH WOODED, SELECTED FROM THE
 HYBRID CHINA AND ALBAS.

Angélique, fine rosy blush.
 Attila, pale flesh.
 Blanche Belgique, white.
 Blush Hip, delicate blush.
 Coupe d'Amour, bright deep rose.
 Coupe d'Hèbe, rich deep pink.
 Duc de Luxembourg, soft lilac blush.
 Etoile de la Malmaison, flesh changing to French white.
 Fanny Somerson, rose, very double.
 Gen. Allard, fine deep rose.
 Henriette Campan, dark purplish rose.
 La Séduisante, rosy blush.
 Madame Audot, pale flesh.
 Madame Legras, pure white.
 Marie de Bourgogne, fine.
 Princess de Lamballe, pure white.
 Thornless Violet, dark velvet.
 Queen of Denmark, rosy pink, pale margin.

ROUGH WOODED, SELECTED FROM THE DAMASK, PROVENCE, GALICA, HYBRID BOURBON, AND HYBRID CHINA.

Adelaide de Senage, pale rose.
 Aglae Adanson, rose spotted white.
 Agonice, fine rosy lilac.
 Alphonse Maille, crimson and purple.
 Anemoneflora, rose streaked with white.
 Bachelière, vivid salmon pink.
 Beauté Parfait, brilliant rose.
 Blanche fleur, white and pink.
 Boule de Nanteuil, crimson purple.
 Brennus, deep carmine.

Cabbage, rose, very large and double.
 Chenedolé, light vivid crimson.
 Christine de Pisan, pink spotted.
 Cleopatra, salmon pink.
 Columelle, rosy crimson and violet.
 Comtesse Lacepède, silvery blush.
 Coralie, fine rose.
 Curled, a singularly formed veined rose.
 Cristata, rose pale edges.
 De Rennes, silvery blush.
 Desseflores, white centre rose.
 Duc de Bassano, white mottled crimson.
 Duchesne, brilliant rose, large.
 Duchesse d'Orleans, light vivid rose.
 Duke of Cambridge, deep purplish rose.
 Duke of Devonshire, rosy lilac striped white.
 Emerance, pale lemon.
 Enchantress, rosy pink.
 Félicité, French white.
 Fontenelle, rose spotted red.
 Fornarina, rose spotted white.
 General Bertrande, fine rose.
 George IV., dark rose, velvet.
 Grandissima, purplish rose.
 Great Western, crimson and purple.
 Grilony, purplish slate.
 Hippocrates, deep crimson lilac.
 Kean, velvety purple, centre scarlet.
 La Chérie, flesh with pink centre.
 Lady Fitzgerald, light brilliant crimson.
 Lady Stuart, silvery blush.
 Laura, rosy lilac.
 La Ville de Bruxelles, light rose.
 La Ville de Londres, bright rose.
 Lavoisier, lilac blush.
 La Volupté, bright rose, large and full.
 L'Ingénue, white rose, buff centre.
 Louis XVI., purple and crimson.
 Madame Damoureaux, deep rose.
 Madelon Friquet, rose spotted with white.
 Madame Hardy, white, large and full.
 Madame Soëtmans, white and buff.
 Marjolin, slate, large.
 Modeste Guérin, rose, mottled white.
 Mrs. Rivers, blush centre rose.
 Nelly, delicate flesh, wax-like.
 New Village Maid, striped pink and white.
 Cœillet Parfait, pure white, striped with
 crimson.
 Orpheline de Juillet, violet and crimson.
 Petit Pierre, bright rosy violet.
 Phédre, very double.
 Pomponne de Bourgogne, fine rose.
 Pope, crimson and violet.
 Rachael, rose pale edged.
 Renne Provence, glossy lilac blush.
 Roehabardon, very deep rose.
 Semilasso, deep red spotted.
 Soliman, purplish rose.
 Spotted, spotted.
 Striped Unique, white, striped with lake.
 Sylvain, dark rose, large.

Tricolor, crimson and purple, striped with
 cream.
 Triomphe d'Abbeville, fine rose.
 Triomphe de Beauté, pink.
 Triomphe de Jassens, rosy crimson and
 purple.
 Triomphe d'Orleans, fine rose.
 Waratah, violet red.
 Wellington, dark rose.
 Wilberforce, deep rosy crimson.
 Zara, soft glossy pink.

ROSES CONTINUOUSLY BLOOMING FROM JUNE
 TO NOVEMBER.—SMOOTH WOODED, SELECTED
 FROM THE BOURBON, CHINA, THÉ AND PER-
 PETUALS.

Alcine, fine rose.
 Amiée Plantier, white tinted with apricot.
 Archduchess Thérèse, creamy white.
 Archduke Charles, pale shaded rose.
 Armosa, fine bright pink.
 Augustine Leleur, vivid even rose.
 Aurora, sulphur tinged with pink.
 Barbot, yellow edges tinged with rose.
 Bougère, deep rosy bronze.
 Bouquet de Flores, light carmine.
 Bride of Abydos, creamy white.
 Carmine Superbe, light carmine.
 Comice de Seine, vivid crimson and purple.
 Comte de Paris, crimson and purple.
 Comtesse de Mélore, fine rose.
 Cramoise Supérieure, crimson.
 Crimson Perpetual, crimson.
 Desfontaines, pure white, large.
 Devoniensis, pale yellow, superb.
 Don Carlos, buff and salmon.
 Eliza Sauvage, yellow, centre orange.
 Eugène Beauharnois, amaranth, large.
 George Cuvier, bright rose.
 Gloire de Paris, bright crimson and violet.
 Joséphine Malton, cream, centre buff.
 Juillet de Loynes, white.
 La Pactole, fine yellow.
 Luxembourg, dark crimson.
 Madl. Bureau, pure pink.
 Madl. Desprez, rosy lilac.
 Madl. Lacharme, delicate flesh.
 Mansais, rose shaded buff.
 Marquis d'Ivry, rosy pink.
 Meillez, white, tinged lemon.
 Miss Fanny, pale blush pink.
 Moirée, yellow and fawn.
 Mrs. Bosanquet, delicate pale pink.
 Napoleon, bright pink.
 Neriene, even rose.
 Pactolus, fine rose.
 Pourpre Fafait, deep crimson purple.
 Princess Clementine, violet and crimson.
 Princess de Modena, flesh.
 Roi d'Angleterre, fine crimson.
 Safranot, buff.

Souvenir de Malmaison, clear flesh, very large.

Strombio, pure white.

Sulphurea Purpurea, bright sulphur.

Triomphe de Luxembourg, coppery rose.

White, white.

Yellow China, yellow.

**SMOOTH WOODED, FLOWERING IN BUNCHES,
SELECTED FROM THE NOISETTES.**

Amiée Vibert, pure white.

Boulogne, dark purple.

Clara Wendel, pale yellow.

Cloth of Gold, yellow edges sulphur.

Crimson, crimson.

Camella Rose, blush.

Comtesse Tolosante, white and flesh.

Elizabeth, French white.

Fellenberg, bright crimson.

Jaune Despres, bronzy fawn.

Lamarque, sulphur and yellow.

Lamarque à Cœur, rose, white fawn centre.

Madame Souvain, rose, buff centre.

Mias Gregg, pure white.

Similar, deep sulphur.

Solfaterre, sulphur yellow.

Vitellina, white centre, flesh and yellow.

Yellow (Smith's), pale yellow.

**ROUGH WOODED, SELECTED FROM BOURBONS,
AND HYBRID PERPETUALS.**

Acidalie, blush white.

Anne Beluse, pale rose.

Antinous, deep rosy purple.

Auberon, rose and scarlet.

Augustin Mouchelet, rose and carmine.

Baron Prevost, pale rose.

Bourbon Queen, buff rose, very fine.

Calliope, bright cherry.

Cardinal Fesch, violet crimson.

Ceres, rose, superb.

Crimson Globe, crimson and purple.

Crimson Perpetual, crimson and purple.

Degaches, deep pink.

Dr. Marx, carmine brilliant.

Duc d'Aumale, rich rosy crimson.

Duchess of Sutherland, pale rose, fine.

Deuil de Duc d'Orleans, crimson and violet.

Du Mont de Courset, carmine marbled.

Edward Defosse, pale pink.

Edward Jesse, dark purple and crimson.

Emily Courtier, fine pale red.

Fournier, brilliant red.

Gloire de Rosamine, vivid crimson.

Gloire Guérin, deep crimson.

Grand Capitaine, fiery crimson.

Lady Alice Peel, deep rosy carmine.

Lady Alice Fordwich, red and purple.

Lane, purplish crimson.

La Reine, rosy pink and lilac.

La Renoncule, red and purple.

Lilacea, lilac and purple.

Louis Buonaparte, vermilion.

Louis Philippe, crimson purple.

Madame Laffay, rosy crimson.

Madame Margat, rosy crimson.

Madame Nerard, silvery blush.

Madame Souchet, blush and crimson.

Marquis Bocella, pink, very sweet.

Mrs. Cripps, pale glossy rose.

Mrs. Elliot, rich rosy purple.

Paul Joseph, dark crimson.

Prince Albert, rose and violet.

Prince de Galles, lilac rose.

Princess Hélène, bright rosy purple.

Proserpine, dark velvety crimson.

Prudence Roesser, rose and pink variable.

Reine de Congrès, blush pink.

Reine de la Guillotière, dark crimson.

Rivers, rose shaded crimson.

Souchet, deep crimson.

William Jesse, crimson and lilac.

Queen, buff rose superb.

**CLIMBING ROSES, BLOOMING MAY, JUNE, AND
JULY.—MOSS.**

Alba, white.

Du Luxembourg, crimson and purple.

Princess Adeline, fine rose.

SMOOTH WOODED (BOURSALTS).

Amadis or Crimson, deep crimson.

Blush, blush, rose centre.

Elegans, crimson purple.

Gracilis, bright rosy red.

Red Boursalt, rosy red lively.

**CONSISTING OF SEMPERVIRENS, AYRESHIRE, AND
BOURBONS.**

Adeline d'Orleans, pale rose.

Astrolabe, bright rose.

Belle de St. Cyr, bright pale rose.

Belle Thurette, dark crimson.

Blairii, bright rose.

Brennus, deep carmine.

Ch. Duval, deep pink.

Chenedolé, light vivid crimson.

Col. Coombes, brilliant red.

Countess Lacépède, silvery blush.

Crimson Superb, dark crimson.

Duke of Devonshire, fine rose.

Dundee Rambler, bright pink and red.

Fulgens, rich deep crimson.

Garland, nankeen and pink.

George IV., dark velvet.

Grilony, purplish slate.

Great Western, crimson and purple.

Hippocrates, deep crimson lilac.

Lady Stewart, silvery blush.

Lady Montgomery, pale rose.

Laura Devoust, pink.

Lovely Rambler, bright pink, single.

Marjolin, slate, large.

Myrrh Scented, white edged red.

Paul Perras, pale rose.
 Petit Pierre, bright rosy violet.
 Richelieu, pale rose.
 Rose Angle, fine rose.
 Scandens, fine rose.
 Spectabile, rosy lilac.
 Sylvain, dark rose.
 Queen of Belgians, creamy white.
 Victor Hugo, rosy lilac.

EVERGREEN.

Banksian White, white.
 Banksian Yellow, yellow.
 Donna Maria, white small and double.
 Félicité Perpetuée, creamy white.
 Myrianthes Renoncule, blush and rose.
 Madame Plantier, white.

CLIMBING ROSES, BLOOMING FROM JUNE TO NOVEMBER.—SELECTED FROM THE BOURBON, CHINA.

Abbé Moiland, fine rose.
 Archduke Charles, pale rose.
 Impératrice Joséphine, pale pink.
 Julie de Lyons, white.
 Marjolin, slate, large.
 Madame Deprez, rosy lilac.
 Madame Lacharme, flesh.
 Marquis d'Ivry, rosy pink.
 Mrs. Bosanquet, delicate pale pink.
 Pourpre Fafait, purple and crimson.

FLOWERING IN BUNCHES.—SELECTED FROM THE NOISETTES.

André Selle.
 Cérise.

Du Luxembourg, lilac rose.
 Euphrosyne, pale rose and yellow.
 Fleur de Jaune Age, sulphur, centre yellow.
 Grandiflora, pale flesh.
 Labiche, pale flesh.
 Lamarque, sulphur yellow.
 Pourpre de Tyre, violet crimson.

MISCELLANEOUS ROSES.

MUSK ROSES.—Ranunculus, pure white ;
 Rivers Musk, pink and buff.

ROSA MICROPHYLLA.—Grandiflora, rose, very large ; Verdier, blush white ; Rubra, rose, dark centre.

MACARTNEY ROSES.—Maria Leonida, white and pink ; Maria Scarlet, scarlet.

MINIATURE ROSES.—Blush, pale pink ; Caprice de Dames, pink ; Dieudonne, red ; Gloire, crimson ; Jenny, brilliant rose ; La Miniature, pink.

BRIARS.

Austrian Yellow, single.
 Austrian Copper, single.
 Double Blush, pink.
 Double Margin Hip.
 Harrisonii, yellow double.
 Persian Yellow, finest double.
 Reigo, most fragrant of roses.
 Rosa sulphurea, golden yellow.
 Scarlet Hip, scarlet.
 Sweet Briar, single.
 Williams's, yellow.

ROSA RUBIFOLIA.—Ballmore Belle, white and pink ; Pallida, white ; blooms in bunches ; Perpetual, rose and purple ; Queen of the Prairies, bright pink.

DILAPIDATED ESTATES.

BY GEORGE GLENNY.

THERE are five thousand gentlemen's houses and mansions, with grounds to them that might be increased in value by judicious outlay, at the rate of a hundred pounds for every ten expended ; and it is a sad reproach to many of the nobility and gentry, that labourers are starving in their neighbourhood for want of work, while every pound expended in labour would better the owner's estate ten times as much. I have observed many of the first-rate places to which the entrance was absolutely discreditable. I have remarked to the owners of some, that they took very little pride in the exterior of their grounds, and the answer has been something like, "I am no friend to outside show," or, "What do we care for the outside?"—answers varied in words, but to the same purpose, expressing their total disregard to outward appearances. But how mistaken is the feeling !—what can

be worse as an example than a neglected ground ? If I know anything of the matter, it is far more important to have the exterior the very perfection of neatness and cleanliness and attention, than it is to have the very drawing-room itself perfect ; because the one is seen by every passer-by, while the other is only seen by the family and their friends. I believe that a large portion of the disloyalty and hatred towards the aristocracy proceeds from a misplaced economy among the wealthy classes. The only evil under which this kingdom suffers—and I write this advisedly—is the want of employment for the industrious classes ; and while the unemployed are the prey of designing men, who teach them that their sufferings are caused by the extravagance of royalty and bad government, they change from quiet sufferers to turbulent and mischievous idlers. The cost of an establishment

shall be two thousand, or ten thousand, or fifty thousand per annum. An estate of any size can keep twenty men at work irrespective of cultivation, in adding value to the property, yet we see the most conspicuous signs of idleness at the very gates, which every labourer that passes can see would be removed by the employment of some of the villagers; and say what you will, the ill word of the industrious classes is a sad blot upon the escutcheon of a gentleman: it is never given without a cause, and it is always a cloud hanging over a house. Their enjoyments are beggarded; they may be feared, but not respected; and instead of a little body guard, which the industrious men in the neighbourhood of a mansion always form around an owner who is respected, there are so many enemies, who, without being moved to acts of hostility, entertain hostile feelings, because, as it is justly alleged, they are no friends to the industrious. There is not a single feature in the management of a high family's affairs, that so universally breeds an ill feeling among the humble classes, as that of being parsimonious in the employment of labour. The most ignorant of the working men know as well as the owner what he ought to do to his estate. The cottager three miles off, knows how much of the land wants draining; where it would be the better for a road; what hollows ought to be filled up, and what hills levelled. The least informed of the population around can tell all about neglected hedges and ditches, bad fences, perishing trees damaging better ones, and all the blots on an estate; and when they know that five hundred pounds laid out would increase the value of the property twice as much, and be the saving of the unemployed labourers, and the making of the village, they naturally hate the man that refuses or neglects to do that much good to his poorer neighbours. I have frequently seen a garden establishment kept up with great extravagance, and the dressed ground immediately round the mansion very neatly managed, while all beyond the garden and the dressed ground was in a very disgraceful state of neglect; and painful as it may be to contemplate half-a-dozen starving families, the surplus labourers of the neighbourhood, who might have been provided for by only keeping the place a little decent, I believe from what I have seen, that nearly all the poverty and misery in the rural districts, would be removed in twenty-four hours, if the resident nobility and gentry would only keep up their estates in a style befitting their rank and their duties; for while I admit a man's legal right to do as he will with his own, I insist, that there are moral and religious obligations which cannot be got over, and nobody has a moral right to neglect his

estate to the injury of his poorer neighbours. I believe, a good deal of the neglect which is apparent in too many places arises from thoughtlessness. A good instead of a bad steward, makes all the difference between good and bad management. The owner, in truth, has too often but little to do with such matters, and many a noble, generous man, who would delight in the opportunity of doing so much good with such little trouble, is hated or despised, when he thinks he is doing every thing to benefit his fellow-creatures. I know instances where men, believing it to be their duty to help their poorer brethren, are prodigal of their money in public and private charities; women, happy in the very thought of doing good, seeking out the distressed to relieve them in secret; yet the estates of these very people, who ought to employ twenty or thirty men in their grounds, are in a state of neglect, only equalled by that of their stewards and managers. I trust I am not offensive in these remarks, but I affirm from my own observation, that in nine cases of every ten, the grounds round a mansion are capable of vast improvement by the employment of labourers, and that in many cases it would be the means of serving the whole neighbourhood, if the owners would but have these improvements made, that would raise the value of the estate in a much larger proportion than the cost. I would strongly urge the proprietors of estates to set about improving them, to consult some one who understands the matter as to what would, or would not be beneficial; not to trust to anybody they have about them for an opinion, but to take that of a person whose eye is not familiar to the place: those who are always looking at an estate have become reconciled to its faults, and do not see blemishes, but they will be easily convinced when the errors or faults are pointed out. I say it not in disparagement to the gardeners nor the stewards, that they are the last persons to see defects, because they are accustomed to them; that which would be at once offensive to a landscape gardener of sound taste, would not be perceptible to a person always on the premises. Even the owner, who is often not so much about the place as the servants are, has become so familiar to downright defects, that he sees nothing to complain of. I will mention one case corroborating this local blindness:—In a place not fourteen miles from London, the gardener showed me a bit of dressed ground rather pretty, but some clumps were sadly out of place. I asked, "If he saw anything the matter with it as a whole?" and he said, "No, he thought it was as perfect a bit of scenery as he ever saw." I observed, that if the place were mine, two clumps which

I pointed out should not remain there twelve hours. After walking round and round them some time very quietly, he asked, whether I would take the responsibility of writing as positive an opinion as I had expressed, and I did; I wrote it in his note-book, "The two clumps, arbutus and rhododendron, should not be in their present place twelve hours, if they were mine." The next thing was, where they should be, or what should be done with fine grown shrubs. There were two very nice places at the side; they were removed, and the gardener "*would never have believed that any possible change could be made in that spot to have made such vast improvement.*" The secret of the matter was this,—when the plants were of small size, they did not appear so great an eye-sore; but the difference between plants from one to two feet high, and from four to six feet high, had made them, to me, unpardonable; but the evil had grown so by degrees, that those on the spot had never noticed it, until the removal made the lawn look of twice the extent it did before, and opened a view which was every way desirable, and could be then seen from the drawing-room window. I mention this, but it is one of a thousand instances in which those always on a spot are blind to the blemishes which are palpable to a strange but practised eye. I therefore recommend the owners of country-houses and grounds, to consult competent persons on the probability of improving their places. Call in the best nursery-man in the neighbourhood, and request him to look round and suggest; or if it be thought that a nursery-man is too much interested, consult any landscape-gardener, and let him report on what can be done, to make the greatest improvement at the least expense. It is best to make a sort of report in three parts: First, those changes only which will *cost little and improve much*; such as the turn of a road, the felling of a tree or two, the planting of a clump; things which do not involve a great change in the laying-out. Second, those alterations which *may be made* with great advantage; such as taking down a hedge to enlarge or extend a lawn, the throwing of timber trees to open extensive views, the making of roads; changes that are more expensive, because more enlarged. Lastly, what should be done, so that the place shall be perfect; such as enlarging or altering ornamental water, the raising of mounds, or levelling hills, and filling up hollows. Where one person will go to the extreme, fifty will act upon the second report, and hundreds upon the first; and this is the species of gardening the most difficult to get done. Landscape gardeners want to do too much: they generally want to make a place all they think it ought to be, and are not con-

tent with making a decided improvement, unless they carry out *all their views*. Now, I never saw a dozen places that could not be *greatly improved* by means of a *little labour*. A slight alteration in the direction of a road, the removal of a clump, the widening or narrowing of a piece of water, the throwing of a tree or two, where an opening was wanting, the planting out of some ugly object, or the exposure of a handsome one, the making of a path, or some such operations, will, in nineteen cases out of twenty, make a great improvement at comparatively little cost, and that chiefly labour by which the poor working men in the neighbourhood could be employed; and I believe that many have been deterred from making beneficial changes by the extravagant notions of those landscape gardeners who find fault with everything, from the grass of the lawn to the chimney-pot of the mansion, and want to revolutionise, instead of reform and improve the whole of an estate. This is not the way to induce improvement, nor is anybody safe in trusting to the taste of a landscape-gardener for a total change. Partial and obvious improvements there can be no mistake about, but many have allowed a landscape-gardener to make a total change, and heartily wished he could have the place brought back to what it was. It is very well to let a professional man lay out grounds that have never been laid out before; he is sure to make something of it; but there is great risk in allowing anybody to overturn altogether the plan of an existing domain, at the risk of pleasing the employer with a new one. He may sigh for noble trees that are gone, and regret the loss of features that are no more; but it will be too late! No, confine the alterations of grounds, parks, gardens, lawns, and dressed grounds already existing to *obvious improvements*. New gardens look pretty on paper. The cheerful groups of trees, the nicely-coloured clumps, the green lawns and gravel walks look fascinating enough; but when reduced to reality, when you are treading on the veritable turf, and looking for the splendid groups, you find the places *where they are to be after twenty years' growth*, but at present only represented by so many spindly sticks. Not that the landscape-gardener can produce matured timber, and if he has a barren waste to make into a garden, he cannot help himself; but in old estates, he should be—nay, he must be—chary about felling trees: he must appropriate all he can. If he cannot move the trees to the walks, he must take the walks to the trees. I wish it were possible to set the nobility and gentry now in the country looking over their estates with competent persons, *with a view to discover the means of profitably employing*

labourers. There are some noble exceptions to the class I have been denouncing, and would it were possible to influence others to follow the example! I could mention particular places and particular persons to whom these remarks apply most forcibly; people and places in the immediate vicinity of starving labourers, but who do nothing towards employing any, although by laying out a few score pounds, they could increase the value of their estates and do no end of service. I should be sorry to be the cause of annoyance to any one by mentioning names, but after all is said and done, it is no more than the duty of a journalist to go very far towards draw-

ing public attention to manifest evils without considering persons, and at this particular time, when the possessors of property should be *prepared to make sacrifices*, it is surely not too much to hope, that those who have the means, should be obliged to do good to others, when, instead of a sacrifice, it would be *a benefit to their own properties*. The approaching winter will be an awful one, unless those who have the means, do everything they can towards employing the humble classes. They want no charity. They are ready with their labour for any who will buy it, and it is their stock in trade, upon the profitable disposal of which, depends their very subsistence.



EPISCIA BICOLOR.

EPISCIA BICOLOR, *Hooker* (two-coloured *Episcia*).—Gesneraceæ § Gesnerææ.

There is in Gesneraceæ plants a considerable resemblance of character, coupled with a large amount of diversity of habit. The present plant, were it not for its colour, would almost call to mind the favourite primrose, harbinger of spring, or among its more immediate allies, some dwarf species of *Gloxinia*, such as *G. hirsuta*.

It was introduced to the Royal Garden at Kew, from New Grenada, where it was obtained by Mr. Purdie, and was sent to England about 1847. "It continues throwing up flowers for several weeks in succession, many growing together among the ample dark foliage." It is a very pretty plant.

This is a perennial herbaceous plant, somewhat creeping and procumbent, having short hairy stems, from which the leaves—large, hairy, and flat spread—are produced; they

are cordato-ovate, acute at the apex, coarsely serrated along the margins, and having a somewhat glossy surface, coarsely reticulated with the veins. The flowers grow from the axils of the leaves, on slender hairy peduncles, which are about as long as the petioles of the leaves. Sometimes they bear but one, at other times two or three flowers; a sufficient number is, however, produced in the aggregate to render the plant an ornamental object. The blossoms themselves are nearly erect, or somewhat inclined; the corolla seated within a hairy five-cleft calyx, and having a short tube, gibbous on one side at the base, dilated above, tumid beneath, and having an oblique mouth. The tube is white within, clearly spotted with purple, and becomes expanded into a spreading limb an inch across, divided into five nearly equal rounded lobes; the bases of the lobes around the throat are white, the rest purple, forming a broad band

around the circumference of the flower. The contrast of colour has a very pretty effect.

This plant requires treatment similar to that given to *Gloxinias*, *Gesneras*, and the *Achimenes*. The compost suitable to it consists of two-thirds leaf-mould, with about a third of light sandy loam, and the pots require to be well drained. During the dormant season, the plants should be kept tolerably dry, to prevent their rotting off; and in

the growing season should be subjected to a strong moist heat, with a liberal share of water, which should be given in a tepid state. The plants should have tolerable-sized pots, which, however, must be well drained. Propagation may be effected by means of cuttings of the stems, and by the leaves planted in sandy soil, and placed where they will be under the influence of a slight degree of heat, both to the soil and atmosphere.

THE ACACIA, AND ITS CULTURE.

THERE is scarcely a genus in which there are so many species, presenting so many different and beautiful forms and habits, but so little variation in colour. Of the hundreds of species known, scarcely one-sixth are anything but yellow; and although several are named as white, or pink, or purple, they are mere apologies for the colours mentioned. We will leave the hundreds of yellow, to notice the few that are otherwise:—*acanthocarpa* is pale red; *acantholoba*, white; *acapulcensis*, white; *amara*, white; *arabica*, white; *arboorea*, pink; *caracasana*, purple; *cassioides*, white; *centrophylla*, white; *Ceratonia*, white; *concinna*, white; *contorta*, white; *diptera*, white; *divaricata*, white; *esculenta*, white; *formosa*, white; *frondosa*, white; *glauca*, white; *guianensis*, white; *hispidissima*, white; *Julibrissin*, white; *Lambertiana*, purple; *latisiliqua*, pink; *latronum*, white; *lebbek*, pink; *leucocephala*, white; *monocantha*, white; *odoratissima*, white; *peregrina*, white; *pilosa*, white; *polyphylla*, white; *portoricensis*, white; *quadrangularis*, white; *reticulata*, white; *Rohriana*, white; *scandens*, purple; *Senegal*, white; *speciosa*, purple; *stipulata*, white; *tamarindifolia*, white; *tetragona*, white; *vaga*, white; *venusta*, pink; *vera*, white; *villosa*, white; *kermesina*, purple. But the great charm of this genus is the extraordinary variation in the habit and form of the plant, the shape of the foliage and flowers, and the general appearance. They comprise stove and greenhouse plants of exceeding grace and elegance, and are justly great favourites in all collections. The culture of all is alike, except the difference in temperature between the stove and greenhouse kinds; but we only value the greenhouse varieties, and shall confine ourselves chiefly to them. They are nearly all evergreens; many form noble trees, very splendid objects for conservatories, and deserving a place wherever room can be made for them.

PROPAGATION FROM CUTTINGS.

All the sorts strike freely, and should be cut when the plant is at rest, before it commences growing; strip the leaves off about

an inch of the lower end of the cuttings which should be cut up to a joint. Fill a wide-mouthed pot with loam, peat, dung and sand in equal quantities, and insert the cuttings an inch deep and half an inch apart, over so much of the pot as will just allow the edge of a bell glass to cover them, and the edge of it to penetrate the soil to exclude the air. Water them in and cover them up, place them on a slight hot-bed or on the tan of the stove, and keep the glass close down; when the sun comes out, cover the glass with a piece of thin canvass or cloth, or a sheet of white paper. Every morning, take off the glass and wipe it dry; if the soil is moist, leave it so, but if at all dry, let there be a little water given, for the cuttings must on no account be dry, as they would perish in a few hours. Continue this attendance day after day until the cuttings have struck root, which will be seen pretty well by their starting into growth.

POTTING.

When the cuttings have struck root, get some pots, size sixty; fill them with a compost formed of turfy peat broken into small pieces and rubbed through a sieve that would pass a hazel nut through, one-third, loam from rotted turves off a pasture, one-third, sand, one-sixth, with decomposed dung, one-sixth. The compost must be well mixed. The pots may be drained by a bit of moss, than which there is nothing better for the first potting of cuttings, because it forms the best drainage and does not rot before the time arrives for a change of pot. Place the cuttings, one in the centre of each pot, water them, to settle the earth about the roots, and place them in the greenhouse, properly shaded from the heat of the sun, until they have fully established themselves and begun to grow. The growth of the cuttings must depend on what you require. Let them grow naturally, according to their habit, or if you want to dwarf them, pinch out the growing point to force out lateral shoots. However, among plants with scarcely two of one habit, it is impossible to dictate. In a general way they are best, and

show themselves to the greatest advantage, when allowed to grow their own way, because it is in the variety of habit that the great charm of the collection consists, and if dwarfed by stopping, this is in some manner changed. Allowing them, however, to grow their own way, there is one rule which may be adopted with all plants in-doors and out; that is, if there be any particular branch taking the lead to the amount of checking the general growth of the plant, the branch should either be materially shortened or cut close off altogether; because the branch that so takes the lead has more than its share of the nourishment, and renders the plant misshapen and unnatural. We do not mean that if the leading shoot grows rapidly upwards, it is to be checked, but any side shoot that makes the plant one sided.

SHIFTING INTO LARGER POTS.

The rule for shifting these plants into larger pots is to perform that operation as soon as the roots reach the side, and begin to run round the ball of earth, and this can only be known by turning out one or two and examining them. The next sized pot to use is forty-eight to the cast, commonly called forty-eights. Let them be one-third filled with crocks, (which are broken pots,) upon these put the soil high enough to allow the ball of earth in which the plant is growing to stand upon it, so that the collar of the plant is even with the top edge of the pot; fill up the soil round it, pressing the earth down without damaging the fine fibres, and gently pressing down the ball so that its surface is even with the surface of the new soil, and just below the edge of the pot, so that it may hold a little water on the surface of the soil. In a day or two after this shift, during which it must be shaded from the sun, the plant may be placed in a cold frame, shaded from the burning heat, but uncovered to the morning and evening sun, and occasionally watered. Here they may grow till it is time to put them into their winter quarters, before which removal, the balls must be examined, to see if the roots are too much matted to grow through the winter; if they are, they had better be shifted before they are housed than after, as the room would not be calculated upon so well, or the potting would have to go over the winter altogether, perhaps to the detriment of the plants. If, however, this has to be done, take thirty-two sized pots, and go through the operation exactly as you do with the first shifted plants. If the crocks that were put in the last pots fall away from the ball when it is turned out, well and good; but if the crocks are held to the ball by the fibres of the roots, let them go into the next pot, the same as if they were all earth, without interfering with

the new drainage of crocks: observe the same rules all through, only instead of confining the plants after potting, place them in the greenhouse at once where they are to remain. They will progress rapidly, for the Acacias are all rapid growers; and need no other stimulant then watering at proper times.

AFTER CULTURE.

The third year, the plants from cuttings assume a finished appearance; they are in good form and condition and good health. They want nothing but proper attention to watering and shifting, and the shifting should, after this, be given when the plants are at rest. The soil too may be varied: leave out the dung; you do not want the plants to grow so rapidly. They flower early in the spring for the most part, and as soon as they have done flowering, they ought to be placed in the air and shade, and not be subject to heavy falls of wet, nor to the striking of their roots into the ground through the holes in the pots, nor to the high or cold winds. The perfection of a place for all these kind of plants—all greenhouse, hard-wooded plants, would be a canvass house, like those over beds of tulips, or collections of carnations and picotees; for these are so contrived that all the air can be given or withheld, all the sun can be let in or excluded, and by opening the side that is away from the weather, the plants would have all the air without any of the roughness of high, or the severity of cold winds. Where these plants, and indeed all hard-wooded plants, can grow in the cool shade, and well sheltered from drying and scorching winds, they cannot well fail to set well for bloom; and here they may remain until the autumn, when they have to be removed to the greenhouse.

TREATMENT OF LARGE PLANTS.

As these plants advance in size, they must be the more carefully attended to, because the treatment must be upon the checking system, and that does not admit of the slightest neglect. For instance, the pots are full of roots, and there must not be the shifting that younger plants have. They must go two seasons instead of one, and this requires the most careful watering, for when pots are full of roots, twenty-four hours' neglect of watering, when the plant wants it, will sometimes be fatal. We have been forced to regularly mutilate a plant when it was getting beyond our control; we have freely pruned the roots, and cut away a good deal of the plant, for in fast growing things like the Acacias they would soon get out of all management if they were shifted as often as they wanted it, and into pots or tubs as large as they required. We have not the least objection to

their being grown and shifted if people have the room and the means; but very few have these desirable acquisitions, and therefore it is better when the plants have got beyond a convenient size to get rid of them altogether, or contract them of their fair proportions. The various species of *Acacia* afford a great choice, and if we were about to grow a collection of greenhouse plants, we should visit Mr. Low, at Clapton, who has perhaps the greatest variety, and choose about half-a-dozen of those which form the best contrast, and are of themselves handsome: and we would rather have young ones to take their place as they get too large, than we would follow the progress of the plant further than into a four or a two-sized pot, when we should keep it there until it died; for the labour of shifting beyond this is not compensated by the plant's enlarged growth.



BRITISH WILD FLOWERS.

THE ARMERIA, OR THRIFT.

Armeria maritima, Willdenow (Thrift, or Sea Gilliflower).—Plumbaginaceæ § Staticeæ. This has been called the most humble and the most lofty of plants, from the circumstance of its growing both on the sea shore and on high mountains, a mode of allocation which is not very common among plants.

Thrift is a perennial herb, with long woody branched roots, the upper part of which may

indeed be regarded as a kind of short stem, being formed of the fibrous bases of the decayed leaves. The leaves, which are narrow, linear, and spreading, are tufted and very numerous; they are dark green and channelled on the upper side. The flower stem, in this case called a scape, is erect, and grows about six inches high, bearing the blossoms on a close round head at the top, beneath which is a brown membranous sheath, the lower edge of which is lacerated. The flower head is supported by an involucre of numerous membranous scales. The blossoms are rose coloured, individually small, but numerous; and the heads are borne so profusely by the plants, and are so well relieved by the dense carpet of foliage beneath them, that when in bloom their appearance is very ornamental. It flowers from June to August, and sometimes in its wild maritime habitats is met with blooming on in the month of October.

The name of Thrift is said to be applied to this plant "from its capability of growing in almost any situation, from the pure clear atmosphere of our mountain tops, and the saline breezes of the sea shore, to the smoke-loaded air of our close cities and towns." It is the same species as the *Statice Armeria* (Linnaeus); and the *Armeria alpina* is not essentially different. Withering states that it is eaten by horses and goats, but that sheep are not fond of it; he adds, "when in full bloom it gives a glowing tinge to pastures on the sea coast." The *Armeria vulgaris* is regarded in Germany as an active diuretic.

As a garden plant, the Thrift is extensively recognised as an excellent subject for planting as an edging to flower borders. Its close tufted evergreen foliage makes it peculiarly suitable for this purpose, and as the flowers are pretty freely produced for several months of the summer, it is a very ornamental edging, and quite appropriate in flower gardens. There are, however, two red-flowered varieties, of which one has the blossoms of a much brighter rose-colour than the other, and this is much to be preferred for all garden purposes. The principal objection to this plant, as an edging, is that it spreads rather too readily over the surface, so that the edgings soon become too wide, or require to be replanted: the latter is in fact the only proper way of rectifying the evil, for severe cutting back to a narrow width often proves very detrimental to the plants. When it is to be planted as an edging, the soil should first be dug up, and broken fine, and then trodden and beaten down firm; a line is then stretched down just where the edge is wanted, and the soil chopped down even with this line, leaving an unbroken angular edge, the top face being horizontal, and the side face almost

perpendicular. The plants of Thrift are then pulled asunder into single heads or crowns, and these are then planted along the line cut out to receive them, in doing which, the top of the plants require to be kept quite level, about two inches above the surface, and the roots are to be firmly fixed in the soil, the plants being set about a couple of inches clear of each other. The lower part should not be at all shortened, as fibres will be produced along the whole length of the old woody portion of the roots.

One particular object which we have in bringing this plant prominently into notice, is to set the hybridizer a task. This Thrift, as already explained, has pink flowers. Now, there are many of the species of this same family, *Statice*, (for *Armeria* is but a division of the *Statice*,) in which the dry membranous, almost "everlasting" bell-shaped calyx, is of a deep blue, and the less durable corolla white, the blossoms when in perfection being thus blue and white, and after the corolla has faded, the durable blue calyx remains as ornamental as a perfect flower. A blue-flowered Thrift would be a very desirable plant, and this is what we would recommend some enthusiastic hybridizer to set about attempting to produce. The best of the species to intermix with the common Thrift, in order to effect this change, would seem to be the *Statice puberula*, a dwarf greenhouse plant, which has large highly-coloured flowers, and is altogether of very neat habit; if the flowers of this were transferred to the thrift, no more could be desired. We leave the suggestion to be put to the test of trial.

Besides the pale and the deep rose-pink flowered Thrift, already alluded to, there is a variety with pure white flowers which is a very desirable plant, either for the flower borders, or for the more common purpose of edging. In the flowering season it would make an edging very distinct from the common kind; and at any other period both would be alike desirable from their evergreen habit. Either of the kinds would be suitable for planting about rock-work. This white-blossomed variety would in all probability be the most suitable on which to make the hybridizing trial just suggested.

NORDMANNIA CORDIFOLIA.

Nordmannia cordifolia, Fischer and Meyer (heart-leaved Nordmannia).—Thymelacææ.

This genus has been founded by Fischer and Meyer, in commemoration, probably, of M. Nordmann, the superintendent of one of the Russian botanic gardens.

Nordmannia cordifolia is an herbaceous perennial plant, growing up to about ten

inches or a foot in height. Its habit is neat, and there is something peculiar in the appearance of its blossoms. From the base of the plant spring a number of what are called radical leaves, from their growing, apparently, directly from the radix, or root. The leaves in this, however, as in many other cases where this kind of habit appears, are not radical, but attached to a short stem, which,



as far as our knowledge goes, does not become very materially lengthened. The leaves are heart-shaped, about three inches long, and attached by a slender foot-stalk of about the same, or a rather greater length. The flower stem grows erect, and throws out alternately, on a considerable length of its upper part, little bunches of flowers, which are of a violet tint, white in the centre. These flowers consist of a number of small spreading, or somewhat reflexed petals, which are curiously twisted each into a little roll, while projecting forwards is a close tuft of pale-coloured stamens, giving the blossoms somewhat the character of those of the American cowslip, though in reality very different in structure. Their blossoms are produced as early as March.

It is a native of China—of the northern provinces, we presume, and not improbably of the countries adjoining. It appears to have been introduced in 1846, and to be cultivated by Messrs. Pope, of Handsworth; but we have no information by what channel it was obtained. Messrs. Pope find it to be a good forcing plant, and hardy enough for culture in a dry sheltered border. It will probably be

of less value as an out-door plant, from the fact of its blooming when its blossoms are very liable to destroying agencies, than as a frame plant, for decorating the greenhouse or sitting room, by removing it there while in blossom.

This pretty plant, writes Mr. Maund, in the *Botanic Garden*, where this plant is figured, reminds us of some of the whimsical architectural ornaments indulged in by the inhabitants of its own country. We cannot,

however, accuse the Chinese of intentionally founding their taste on too strict an adherence to the beauties displayed in natural productions. They love extravagant embellishment; but to do them justice, it should be observed that there is no difficulty in referring the general features of their splendid pagodas to the fir tribe. It is the curious twisted petals, standing out nearly at a right angle from the conical cluster of stamens, to which Mr. Maund here alludes.

NEW FLOWERS AND PLANTS.

LEUCHTENBERGIA PRINCIPIS, *Hooker* (noble *Leuchtenbergia*).—Cactaceæ § Cereidæ.—A most remarkable member of the Cactaceæ order, presenting indeed, when out of bloom, but little resemblance to the more familiar forms of the order. "The stem, looking as if formed of the persistent bases of old leaves, resembles that of some Cycadææ," while "the mammillæ have rather the appearance of the leaves of some Aloid plant" than that which they are prone to bear. The largest plants at present in this country are about a foot in height, with the main trunk erect but crooked, as thick as a man's arm, and clothed with the dense mass of the persistent bases of the old mammillæ, which in the upper part become more and more perfect; the perfectly formed mammillæ of the crown of the plant being four or five inches long, triangular, truncated, and bearing at the apex a tuft of six or seven long chaffy or almost horny scales, which become deciduous. The flowers grow from the summit of the plant, solitary from the axils of the mammillæ, and are about four inches across, and of a sulphur yellow colour, differing, as Sir W. Hooker remarks, in no particular from those of a *Cereus* in their structure. Native of Rio del Monte in Mexico. Introduced to the royal garden, Kew, by John Taylor, Esq. Flowers in the summer months. *Culture*.—Requires a warm greenhouse; sandy loam mixed with broken crocks and lime rubbish; propagated by planting the lateral offshoots when produced, or by seeds.

SONERILA STRICTA, *Hooker* (upright *Sonerila*).—Melastomaceæ § Melastomæ - Lavoisieræ).—An interesting though not very showy species, remarkable in its natural family for its trimerous flowers, which are rare amongst these plants. It is an annual, with slender red tetragonous branched stems, a span or more in height, and having the linear-lanceolate serrated leaves in distinct pairs, except the uppermost on the branches, which are in whorls of four; the leaves are dark green above and purple beneath. The flowers grow in terminal spikes of from six to nine, and consist of three spreading obovate deep-rose

coloured petals. Native of Java, whence it was sent by Mr. Thomas Lobb to Messrs. Veitch of Exeter. Introduced about 1847. Flowers in May. *Culture*.—Requires a stove; light rich vegetable soil; propagated by seeds.

GMELENA RHEEDI, *Hooker* (*Rheede's Gmelina*).—Verbenaceæ.—A tree in its native country, and attaining a large size even when cramped in a pot, so that probably it will hardly become available for cultivation. The whole plant is softly pubescent, the leaves opposite, on long petioles, rhomboid-cordate, dark green on the upper side, and greyish on the lower side from more copious down. The flowers grow in a thyrse, and are large and showy, of a dark tawny yellow, paler and very downy externally; the corolla is ventricosely bell-shaped, with a spreading two-lipped limb, divided into five roundish nearly equal lobes, the margins of which soon become reflexed after expansion. Native of Malabar. Introduced to the royal garden at Kew, so long since that the period is unknown, but has not produced blossoms till the present year. Flowers in May. It is the *Cumbula* of *Rheede's Hortus Malabaricus*. *Culture*.—Requires a stove; loam, peat and sand; propagated by cuttings planted in sand, and placed in a gentle heat.

GOMPHRENA OFFICINALIS, *Martius* (official *Gomphrena*).—Amaranthaceæ.—A very singular looking plant, the flower heads of which are handsome; little experience of the plant has, however, yet been had in a cultivated state. It has a large perennial, tuberous root, which sometimes assumes the size of a man's fist. The stems are slender, but naturally ascending, purple, thickly coated with long rigid pale brownish hairs; they grow about a foot high, and each bears three or four pair of leaves, which are shaggy like the stems, but of a dull dark green colour, and ovate or oblong-oval form. The flowers grow in terminal hemispherical heads, which are sometimes three inches in diameter, and composed of deep-red shining flowers; these heads are surrounded by an involucre of several rows of acute bracts; and external to each flower

is a dry membranous elongate-triangular bractlet, which is scarlet in the middle; the inner bractlets and the calyx also are of a deep scarlet. The thick root, called *Paratodo* by the Brazilians, is employed as a stimulating tonic in spasms, intermittents, diarrhoea, &c.

Native of Brazil. Introduced in 1847 to the botanic garden of the Society of Apothecaries at Chelsea. Flowering season not known. *Culture*.—Requires a stove; light well drained soil; propagated probably by cuttings of the young shoots placed in a slight bottom heat.

MITRARIA COCCINEA.

Mitraria coccinea, Cavanilles (scarlet-flowered Mitraria).—Gesneraceæ § Gesnerææ.

This is the only species of *Mitraria* yet introduced to our gardens; and, indeed, as far as we are aware, at present known. The genus, founded by Cavanilles, derives its name from the term *mitra*, signifying a mitre, which becomes applicable to the present plant in allusion to the bracteas that cover the calyces, these having the form of a mitre.



This *Mitraria* is of a shrubby habit, having a scandent stem, which does not appear to attain any great height, probably not more than three or four feet. These stems are clothed with small neat-looking leaves of an ovate figure, about an inch or rather more in length; they grow in pairs opposite each other, and are somewhat pointed at the apex, and serrated along the margin. From the axils of the leaves along the upper part of the

stems and branches the flowers are produced, one from each axil; they hang dependent on long slender peduncles, two inches in length, and consist of a five-parted calyx, covered by a two-lobed mitre-formed bract, and a tubular corolla, an inch and a half long, and upwards of half an inch in diameter; the tube of the corolla is considerably swollen or ventricose on one side, and at the apex is two-lipped, the upper lip consisting of two rounded lobes, and the lower lip of three lobes of similar shape but smaller than the upper ones. The blossoms are produced freely, and are of a vivid scarlet colour.

It is a native of the island of San Carlos de Chiloe, and from thence was introduced to this country about 1847, by Messrs. Veitch of Exeter, through the agency of their collector, Mr. Lobb. Finely bloomed plants have been produced in public by Messrs. Veitch during the summer of the present year. It is believed that this plant will prove to be suitable at least for planting against a wall in the open air, if it be not more hardy. It will no doubt be a very useful plant for turning out in the flower garden, as a dwarf climber, during the summer months; and will also be an ornamental plant for pot culture. In the latter case, the pots must be well drained: and a compost should be employed consisting of one part each of light turfy loam and peat, to two parts of good leaf-mould. In the spring, the plants should be kept well shifted on into larger pots, and encouraged to grow in the temperature of a greenhouse. The branches as they grow should be spirally disposed around a series of light slender stakes, so placed as to form a cylindrical trellis. When planted as a flower-garden climber, light rich earth should be provided for its roots; well established plants of some size should be planted out, and they should be trained around a light wire cylinder or pillar trellis. A sheltered situation would probably be found preferable for plants grown in this exposed condition. As a wall plant, it may be planted on any aspect, the north being least desirable, and should have a light soil prepared for it, and a considerable area well drained for its roots. The branches may be fastened to the wall, or to a trellis contiguous thereto, and should be trained so as to allow light and air to play among them; in a word, they should not be

allowed to run wild and become crowded, smothering each other, as is too commonly the case with wall plants, and the cause of numerous disappointments. Plants such as these cannot flower in perfection—if, indeed, they bloom at all—when, after having grown together into entangled masses, with the branches choking and shading each other, they are suddenly and at once thinned out to the proportions they ought not to have been allowed to exceed, and the stems and leaves exposed without preparation to the play of uninterrupted light, the chill of unbroken winds, and all the other trying and parching influences of exposure. Besides this, severe and sudden pruning is often of itself productive of serious injury to plants. For these reasons it is, that gradual, and, as it were, incessant thinning of the branches is necessary where a high degree of perfection is sought to be attained, and where, moreover, there is any tendency to become crowded. The branches must be supported, so as not to suffer injury from rough winds. Until its hardness has been fully tested, it would be proper to cover over in winter such

plants as may be planted out with the view to their becoming permanent. The best protectives are a good thickness of any material which would throw off wet from the roots, aided by a few fronds of fern fastened over the branches, so as just thinly to cover them, the whole aided, if need be, by a light frame covered with transparent waterproofed calico, the top reaching above the plant, and the bottom projecting from the wall a yard or so, to keep the soil about the roots perfectly dry; the ends might or might not be closed up. About a foot or more of the base of the stem should be assiduously enveloped in a good thickness of some nonconducting material, such as dry loose sawdust, or ashes.

The propagation of this *Mitraria* is not a matter of great difficulty. Cuttings of the young shoots when they have about half reached maturity—in technical language, “cuttings of the half-ripened wood”—if planted carefully in the ordinary way in pots of sand, and placed where there is a slight degree of bottom heat, shade, and a close atmosphere, will make roots.

CONTEMPORARY WRITINGS AND ORIGINAL NOTES.

GROWING PLANTS IN MOSS.—Various experiments in growing stove and greenhouse plants entirely without soil about their roots, have been carried on for some years in the garden of the Caledonian Horticultural Society, by Mr. J. McNab, the superintendent. In those experiments, the plan generally adopted has been to shake all the soil from among the roots, which are enveloped in moss, and the plants are then suspended from the roof of the house, the moss—and consequently the roots—being preserved in a moist state by means of worsted syphons connected with phials, or vessels of water, suspended near the plants. Success has generally attended these experiments, the plants growing well, and also producing their blossoms. Some of these plants were produced at a meeting of the Society held in March, 1848, and among them were two plants of *Camellias*, in bloom, which had been subjected to the above treatment since July 1847. There was also a very fine specimen of the *Strelitzia reginae*, which had been grown on this plan for the last three years, and had never failed under this mode of treatment to produce its gorgeous flowers twice in the course of each year, in spring and in autumn, during the months of February and March, and also during August and September. In the ordinary mode of culture it is not easy to induce this plant to produce its blossoms, even once in every year. It thus appears, that many plants besides those usually regarded as epiphytes,

may be grown successfully on the same principle.

GRAFTING OR BUDDING MANY SORTS ON ONE STOCK.—The greatest mistake that can be made in performing this operation is in using grafts of different habits; some growing vigorously, others slowly; some weak and pendulous, others stiff and short-jointed. It is a favourite subject with many amateurs, and the Rose is one of the most attractive of all flowers for the operation. The China Rose that has been for years inhabiting the front of a house, is one of the most inviting stocks that can be selected for the chances of success. The sorts intended for insertion should be all of the smooth-wooded kinds. The China Rose must be cut in very much, and care must be taken that the most vigorous shoots of the present season's wood be left to bud on. It is best to destroy the China Rose growth, and confine it to the buds inserted. One of the most favourite of them is the yellow Noisette; for however reluctant this seems to open when grown on its own bottom, it flourishes well on a vigorous branch of the common China. Let the choice of sorts be according to the colour and habit. The whole of the smooth-wooded kinds, and most of the Noisettes, do well. Let the buds be put in on the strong new wood, but as close down to the old wood as possible, and as the buds grow, secure them to the wall or trellis. Some roses are so rampant in their growth that they will hardly grow where there

is a second ; like, for example, Noisette Lamarque, which will actually grow ten feet, or more, in a single season. It would be folly to put a bud of this on anything intended for a variety, for it would rob the stock of all the nourishment, and others would not succeed. Whenever you intend to do anything of this kind, look well to the habit and colour of those about the garden ; select different colours, but growths as similar as possible, and when you have marked a sufficient number, prepare your stock by cutting away great part of the side or secondary branches of old wood, confining what is left to the main trunk and sufficient of the main branches for your purpose. Begin from the bottom to cut away useless old wood, but preserve every very strong shoot of young wood. Shorten even these to two or three joints, and work the buds as close down to the old wood as possible, leaving two joints only beyond it ; this is in case the first bud fails, for you have then a place between the first and second joints to insert another. You will soon be gratified with the growth of the buds. We have said nothing of the process of budding, because a reference to former parts of this volume will give this information as well as it can be given, but there is no operation in gardening so well worth learning and pursuing. The grafting of the rose is not so desirable as budding ; but the plant that most invites grafting of different kinds is the *Camellia Japonica* ; not that there are so many varieties of colour as there are in the rose, but it is a handsome plant, and capable of being grown into a beautiful object. There is nothing more important than the selection of sorts ; here there are several colours worth mixing, and that grow well together ; *Presse's Eclipse* (red and white), *Fimbriata* (white), *Myrtifolia* (rose colour), *Double Stripe* (blotched), *Chandlerii* (blood colour), and *Elegans* (pink), have grown on the same stock for years, and by judicious pruning, just before the plant makes its growth, they can be kept in excellent order. The stock, in this case, should be cut back to a skeleton, with only just sufficient branches to take the grafts, and then cut back to the shoot nearest the stump. The period chosen for the grafting should be just before the plants start for their growth ; and the simplest way of grafting is the same as if you were going to inarch. There should always be a shoot left on the extremity of each branch of the stock, to keep up the circulation of the sap beyond where the graft is inserted. As soon as the grafts all grow, cut away every growing part of the stock. If any one of the grafts grows more vigorously than the others, it must be reduced very carefully ; not by any violent deprivation, so as to cause lateral

growth, but by taking pieces clean away close to the stem from which it branches. Each branch must be treated as if it were a separate plant, and stopped at the ends, or encouraged, just as the growth may happen to be wanted, or otherwise, for the sake of the general form of the tree, which must be made as handsome as it can be ; and this can only be done by taking away wood where it is too thick, or too strong, and encouraging it where it is deficient. The plant, when once in any reasonable form, may be treated the same as any other *Camellia*. The best stock for this grafting is the single, or semi-double red called *Middlemist's Red*. The grafting of several fruits on one tree must be managed in the same way. The habit and seasons must be the same to look well, but, for use, different seasons are best ; for as one comes off ripe, the others are helped ; but these are for use, not ornament.

POTATOES.—It has frequently been remarked, that such and such kind of potatoes do not eat well until after Christmas. We recollect it to have been said over and over again of some popular sorts. Let us first consider whether there is any foundation for the saying, and next, if there be any mode of obviating it. It is always said of late potatoes, which are mostly got up and stored in a hurry. Late potatoes are more moist than early ones, because they have rarely such a dry time of it as the early ones. As it happens, then, that there is more moisture, the potato will hardly cook so dry, and therefore will not eat so well. There is at any rate in this hypothesis a fair excuse for the worse quality of the potato. Now let us inquire what is the probable cause of their improving after Christmas ? As excess of wet made them worse, the keeping of them, if kept properly, will have the effect of drying ; consequently, there is nothing unnatural in presuming that getting rid of some of the excessive moisture which spoiled them, improves them. And now, reader, we bring the matter to something like a bearing, and advise you to take up your potatoes in fine weather, if possible, and let them have the benefit of drying a few days on the soil, if possible, or spread in a dry barn before you store them ; always presuming we are not advising a dealer, for he would be too much concerned at the loss of ten per cent. in weight, to wish any of the moisture out of his crop. However, it is quite certain that a potato that eats watery, will nine times out of ten be cured on exposure to dry air. The London retailers spoil the quality of all the potatoes they have through their hands, by soaking them in water as many hours as they are capable of absorbing it. We have seen the effect of this soaking

on the finest potato that was ever cooked, and if any one desires to try the effect, let him, after he has dug up enough for two dishes. Let one be three hours in water, and the other three hours in the dry. He may then tell us which of the dressings he likes best. But the London retailers will wet them the over night, and in the morning take them out of the water considerably heavier. Our inquisitive reader, by the by, should weigh both his dressings when dug up, and just for curiosity see how much heavier the soaked ones are than the dry ones.

LOOK TO YOUR SOIL.—The first thing that should be done on taking possession of a garden, is to look at the quality of soil. This must be done by digging a hole a yard square, to give room to go down some distance. If there be more than a foot of good top soil, you may expect a crop; if there be two feet, so as to bear trenching properly, you may reckon it fortunate; and if the under part of the good soil appears to have been undisturbed for some time, the first job after thoroughly draining it should be to trench all the vacant spaces at once, and to trench the others as fast as they become vacant. The draining ought to be done before anything, for if the soil be ever so dry it never can do harm, and there is not one case in a hundred but what it will do good. If the subsoil be clay, let the drains be three feet and a half, or at least three feet, from the general surface. It will be deeper here and there, where the ground has a sudden rise, but no part of it should on any account be nearer the surface than three feet, and in all draining let the drains run straight down from the highest to the lowest, and not, as is too often the case, diagonally or obliquely. If there is positively no outlet or run off for water, make a pond to take all the water; and be it remembered, that if the water comes occasionally above the pipes, and it only emptied them two or three times in a year, even that is of great, incalculable use, for were the drains not there, all would be perpetually stagnant.

CABBAGES FOR SEED.—Always select the best, and as the heart will almost rot before it will grow, chop the cabbage half way down and across, to give it a better opportunity of growing. Then take the greatest care that nothing of the cabbage tribe, brocoli, Brussels sprouts, kale, cauliflower, pickling cabbages, or indeed any thing of the kind, be allowed to bloom near them, for any one would spoil the sort and disappoint your hopes. When the pods begin to ripen, pull up the plant, and carry it all into the shed to dry at leisure. When it has dried a little, cut off all the seed branches, and lay them on a cloth, that they may be easily carried out in the sunshine, and

as quickly removed in bad weather. It must be thoroughly dried before you thrash it out, and clean it to lay by, and then it must be put in the dry till used.

CABBAGES.—To obtain two crops of cabbages from one planting, it is only necessary, when the piece is cut over, to watch the growth of sprouts, and before they have grown large enough to take any of the strength from the stump, rub off all but the best, and earth all of the cabbages or rather cabbage-stumps up. The second crop will be quite as fine as the first, and in many cases much finer. The great advantage of this is, that there is a complete second crop of good cabbages, and not a parcel of unsaleable sprouts. It is easy to calculate how long it will take a man to earth up an acre of cabbages, and how long it will take, when they begin to grow, to rub off all but one sprout from every plant. The earthing up sets the cabbage rooting afresh all the way that the earth covers the stem.

ASPARAGUS.—How singular does it seem that this plant should be tough and unpalatable, where all other plants are tender and mild! The portion of the asparagus that is blanched, is tough, stringy, and nauseous. Celery is the reverse. Sea kale, the very substitute for asparagus, is only eatable where it is blanched. In the case of the other vegetables, sea kale and celery, all above ground is nauseous; in the asparagus, that alone that is above ground is tender and pleasant. This, however, is only up to a certain point, because as the plant becomes open and more developed, asparagus gets less agreeable, until in an advanced stage it is not eatable at all.

IMPROVEMENT OF RACES.—It is almost impossible to look over a bed of anything raised from seed, without discovering some one (or more) among them better than the rest; and if the seed from that best one (or more) were saved, there would be a visible improvement in the stock, and this would be the more perceptible in proportion to the means you possess of preventing the worse from impregnating the best. In a common tree like the Laburnum, if you raise a hundred or two from seed, you will discover some earlier than others, some with the racemes of their golden flowers larger and longer than others, some of different habits. A ride through Bushy Park or Hampton Court just as the noble chestnuts are coming into flower, will convince any observer that even those, which have all been raised from seed, exhibit many different qualities. Some bloom earlier, others have darker or lighter foliage, smaller or larger flowers or foliage, and the spikes of bloom far more noble. In a row of peas or scarlet beans, there will be a difference in favour of individual plants; and were we to follow up the

inspection through every thing produced from seed, the fact of some being better than others would be manifest. The grand secret, then, of improving anything, is to save seed only from the best, and follow up this plan in every thing, not for one year, but for always.

CUCUMBERS.—Time was when the gardener thought it necessary to impregnate the blossoms on the ends of the cucumbers, as if the fruit could not be perfected without it. But this was an error. Those fruit grow the handsomest which are not impregnated, and therefore for use are better than others which are fertilized. It is only when you want the seed to grow, that the impregnation is necessary. In all the old gardening books, the grower is directed to take the male blossoms which have no fruit on them, and to put the pollen or dust upon the stigma of the female blossom for all the early fruit, because, as was well imagined, there were no bees nor other insects about to carry it from one to the other. But this has been long exploded, because it is found that the only result of non-impregnation is, that the seeds will not grow unless it be so,—a consequence which does not make the fruit one jot the worse for eating, and certainly not worse for the beauty of the green fruit.

BUDDING THE YELLOW ROSE. BY JOHN WILLIAMS, ESQ.—The double yellow rose does not flower with me as a standard bush; in fact, it does not blossom well except in certain situations and soils. I had buds of this rose inserted on strong shoots of a musk cluster rose, which is trained on the east front of my house. It produced many buds, several became perfect flowers, and I think all would have opened, had it not been for the unusual coldness of the spring, and the attacks of Aphides. Specimens of yellow roses in a very perfect state, and fully expanded, were shown at the Horticultural Rooms, gathered from branches produced from a bud inserted on a strong plant of the common Chinese rose growing against a wall with a western aspect. The operation had been performed in April 1822, with a spring bud having a little of the wood attached to it; it had grown so vigorously as to produce upwards of thirty flower-buds in the present season, part of which were taken off, to prevent the exhaustion of the plant; some of the remainder were those exhibited. Mr. Palmer prefers the spring for the insertion of the buds, having been more successful at that time than at Midsummer. The result of this experiment is very important, since the double yellow rose will not live on its own roots in Mr. Palmer's garden.—*Horticultural Proceedings*, 1823.

THE CULTIVATION OF THE GRANADILLA, OR PASSIFLORA QUADRANGULARIS.—The Pas-

siflora quadrangularis is readily propagated by seeds or cuttings. It requires to be grown in rich loam, in which I usually plant it, in a corner of the pit of a pine-stove, the heat of which is essential to its well doing. The space in which it is planted is separated from the bark by a partition of stones, which are perforated, to allow the roots to enter the bark.

In December, cut in the shoots to either three or four eyes of the stem or old wood; let it remain untouched till the beginning of March following, by which time it will have made shoots three or four feet long. In March, cut off the roots all round within six inches of the stem, leaving only a ball of roots attached to the plant, of about one foot diameter; the ball is immediately replaced in its position, care being taken not to shake it, and the space round it filled with fresh earth, and then give it plenty of water, of which it requires an abundant supply during the summer months. Except the fresh earth which is given to it at the time its roots are pruned, it requires no other dressing. The shoots of each plant, being in number from seven to ten, must be trained under the rafters of the house, in the manner of the grape vine, and will extend twenty feet in the course of the season, being carried horizontally on wires from the tops of the rafters along the upper part of the house. The plant begins to flower in May, but being excluded from the action of the air, and the communication usually effected by insects, the farina from the male does not readily come in contact with the female part of the flower, and therefore some artificial assistance is necessary to fecundate the germs. This is given by a camel's-hair pencil being lightly drawn over the anthers, when they are in a proper state, and applied to the style; the operation should be performed about nine or ten o'clock in the forenoon, and if the plant be in good health, the fruit will then set kindly, especially if the fecundation takes place when the weather is clear and warm.

The fruit that sets in May usually ripens in the end of August, or early in September. As the plant flowers at intervals of three weeks, never let more than five or six fruit of one setting remain, but keep up a succession, so as to make the crop last till the end of November.—*Horticultural Proceedings*, 1818.

[This plant requires plenty of room, and has been seen growing luxuriantly in many greenhouses. The show-house at the British Nursery had one in it, and with very little care or trouble it fruited plentifully, and looked very striking. It is a plant which we should not care to cultivate, unless we had abundance of accommodation.]

PRACTICAL HINTS TO AMATEUR GARDENERS.

PLANTS that are grown too fast cannot be handsome. The more rapid the growth, the further apart are the leaves, the longer the bare part of the stems. Flowering plants are better grown too slow than too fast.

Much fruit is spoiled on standard trees by growing too thick. They should be thinned like wall fruit; they would grow finer, and the crops would be more regular.

American plants, such as rhododendrons, azaleas, and the like, that have to grow on the decline of the flowering in the hot months of June, July, and August, should be copiously watered directly they are out of flower.

Never buy any quantity of seed without knowing the party you buy of; and before you depend on it for a crop, put a hundred grains in a hot-bed, and see what proportion is alive and what dead.

Always earth up the cabbage tribe of plants as high as the lower leaves; the stems will strike out fresh roots all the way up, and derive the greatest benefit from that new source of nourishment.

Plants that grow tall and ugly, and flower at top, should be struck when three parts grown up. The tops come into flower quite dwarfs. *Chrysanthemums* are of this description.

The forcing of plants into flower early by heat should be managed carefully; begin cool, and gradually increase it week after week until it will bear the stove. Too sudden a change of temperature destroys the beauty and sometimes the plant.

By pruning roses in March, April, and May, a portion each month, you will create a long season of flowering. The growth pushes for the ends, and by cutting the branches back to eyes that have not even started, you can protract them a month.

A lilac is best as a standard, because all the heads will bloom, whereas all of a bush does not; besides, you can keep down the suckers which spoil all neglected lilac bushes.

All herbs may be dried green, rubbed into powder and bottled; but the seeds of parsley, fennel, celery, &c. will impart all the flavour to soups, stews, hashes, &c.

When you syringe trees to destroy vermin, clear the ground immediately under them, for grubs or flies washed off will not be all killed, and many would return.

Autumn sown parsnips have for two seasons beaten the spring sown ones in weight and appearance; in flavour no difference; but neither of the winters was severe.

Potatoes receive the attack of disease in the haulm; if lime be sprinkled on the dis-

eased part, it dries, and stops it. If the haulm be cut off below the parts affected, they suffer no more; but as potatoes, like all other roots, bulbs, and tubers, derive nourishment from leaves, depriving them of part before they have swelled, lessens the crop.

Few people do half enough with litter for protection. Pea-haulm half a foot thick will save almost any crop from frost, but it should never be on an hour in mild weather.

Plants in pots, standing in the open air, are much sooner affected by frost than plants in the ground, because the frost gets through the sides of a pot, and freezes the tender fibres, which are always next to it, whereas in the ground it does not reach till long afterwards, if at all.

In pruning, always cut sloping upwards, that the wet may not lie, which it will on a flat surface; also, always have a bud opposite part of the sloping cut.

In grafting, take care that the bark of the graft and the bark of the stock meet and join on one side; if the other is an inch off, or six inches off, it will not affect the union.

Never allow the seeds of any weed to ripen on the ground; if this were always attended to, a garden or farm would soon be cleaner, and in time clean.

Never allow a hedge to get foul, or anything to grow in a ditch; it is a receptacle for weed-seeds, and if neglected would soon make the adjoining ground as foul as itself.

Always clip hedges, to keep them down, and make them grow close. If you neglect this, they grow open and naked at the bottom, and keep off the air, and sometimes the sun, by their overgrown tops.

One good watering that saturates the ground, does more good, and will last longer, than half-a-dozen daily sprinklings, or partially watering each plant.

Seeds may be covered in general about their own thickness, so that they be fairly covered, though they will grow if deeper. Beans and peas, therefore, must be deeper than cabbage or mustard-seed.

The bulbs or corms of the crocus die every year, and new ones come on the top of the old ones, at the bottom of the shoots. Therefore, every year brings them nearer the top. When they are not taken up, an inch of earth should be put on the top of the bed.

Always earth up plants of any kind in fine weather, so that the earth will work well, and bruise easily, so that the lumps may be broken small, and the soil set close in to the stem of the plant.

Plants in pots should be kept dry in winter time; they take less harm in case of frost. So that life be kept in them, they cannot be watered too little. The plants are then at rest.

Those alone can be fairly called hardy annuals that will bear sowing in the autumn, to bloom in the spring. Two-thirds of the things called hardy annuals are killed with a slight frost.

The twigs of fruit trees intended for grafting are sometimes obtained long before they can be used. Put the lower half of them into the ground, and they will keep for weeks as well as if they grew on the tree.

Borage is said to be good for bees, and should be sown in the neighbourhood of hives. They want only thinning, if too crowded, and grow well in the common borders.

The sun should never reach the bloom of a tulip. One hour's hot mid-day sun would shorten the flowering season a week. Those tulips under shade are in flower a fortnight longer than those exposed.

It is of no use fumigating a house with tobacco-smoke to kill insects, unless the place be made air-tight, and be thoroughly filled. The house begins to fill at top, as the smoke ascends, and looks filled long before it is so at the bottom.

In all cases, the removal of flowers and the seed-pods the instant they are past their prime, strengthens the plant, and prolongs the flowering. It weakens a plant more to perfect seed than it does to grow branches.

Prune standard fruit trees as regularly as wall-fruit trees, though not so particularly; but the heads ought to be thinned out, to let in the sun and air, and all spindly and weakly shoots removed.

Plant always kitchen crops after wet weather. Plant shrubs and trees in dry weather, when the earth crumbles well, and runs in between the fibres and thick roots. Water well before covering quite up.

Uneven turf or grass land can never be made into good lawn, but it can be wonderfully improved by cutting the grass close, filling up all the hollows with road-sand or drift, and well rolling it. If there be any of the holes deep, a few grass seeds sprinkled on such places will help.

Drain all your lands, that the surface may be laid level. Never resort to open or surface drains, if you can help it; they create great water, especially in grass lands. Some meadows are absolutely spoiled by surface draining.

Hot-houses, green-houses, pits, and other horticultural buildings for supplying a warmer atmosphere than the open air, should always

be cooler at night than in the daytime. It is too frequently managed to have the reverse; the fires are made up in the evening, and the plants are forced more in the dark than in daylight.

Never grow anything carelessly. If it be worth growing at all, it is worth growing properly. Jerusalem Artichokes and Horseradish are both treated ill, but there is no comparison in their quality when treated as weeds, and when cultivated as they should be. Both ought to be planted in clean ground every year, though horseradish is better two years old or three; and as they come ready, clear the ground of them. Artichokes may be cleared out once a year.

Turnips for families should be sown frequently, always in or just after wet weather; so that there be not too many sown at once, the advantage will be great. There is not a more useful vegetable, nor a more general favourite.

Coleworts are a coarse kind of greens sold in bunches. Of late years, market gardeners have found young plants of cabbage eat much better, and they are good at any stage of their growth. Cabbage plants may always be planted at half or third distances, so that the intermediate ones may be pulled for coleworts from time to time, the others left to cabbage.

Broad Beans should always be topped when in full bloom. While the plant is growing, it takes from the swelling pods the strength they require; take off the tops, and all the strength goes to the seed.

Directly a Cauliflower shows its white heart well, break down the upper leaves upon it, so as to exclude the sun, which would turn it yellow long before it comes to its full size.

Fruit should always be gathered in dry weather, and when the sun has dried up the dew. Many sorts are gathered unripe, but there should be a rule for this. Apples and pears for keeping should be taken when the pips are just showing colour, however faintly.

The reason why straight walks and roads are not proper in landscape gardening is, that we find no such things in nature, and landscape gardening is, properly speaking, an imitation of the beauties of nature.

From the instant the leaves fall, deciduous trees may be moved; but from the time the buds begin to swell, the delay is not good, though it may not be of any serious damage if care be used, any time before they burst.

All plants remove best when they are resting, but evergreens growing in peat earth can be removed with any quantity of earth to their roots, and are often removed actually in bloom.

Never trample on dug ground in wet weather more than you can help, and especially if

the soil be adhesive. It forces the air out and makes it hard and solid as it dries, and so should be avoided.

Bulbs and tubers should never be kept out of the ground a day after they indicate growth. All they shoot out of the earth weakens them and affects the bloom.

Potatoes that have begun to shoot should never be used for seed, if it can be avoided ; and on no account should they be cut in that state for sets. If they must be used, plant them whole.

Leeks, though not usually grown so, are the better for earthing up a little after the fashion of celery ; there is more of the plant blanched.

Mint and Fennel are both in demand sooner than they come up naturally. A few roots in pots, put in a hot-bed early, yield a supply till they come in the open air.

Private people used to plant the tops of horseradish to produce good sticks. An inch of horseradish from any part of a rough stick is quite as good as the crown.

Peas may be had from June till September, and sometimes through October, by continuing a succession of sowing of those kinds which are the shortest time growing ; but in hot weather, young crops must be shaded a little and well watered.

Spinach : many sow the prickly or winter spinach only for winter use, but the round leaved or spring kind has been known to stand as well, and the flavour is better.

Never attempt to save seed from two sorts of the Cabbage family at the same time, each is sure to spoil the other.

Ground that is to be vacant in winter time should always be left rough or in ridges. The more the frost can penetrate it, the better it is. If the whole depth of a spade could be frozen through, it would be as good as a coat of dung.

Worms can be killed with salt or strong lime water. The former, however, will kill plants also, if used so as to reach their roots in any quantity.

The common Daisy root, or Carrots, are so attractive to the wire worm that they will leave anything planted near them to bury themselves in their more favourite food ; pull up the daisy roots and carrots every two days and kill all that stick on them.

Flowers and shrubs near dwellings should be, for the most part, fragrant, or at least there should be enough fragrance to impart all the sweets of the garden at the opening of a door or window.

A plant which comes out at a guinea may be had in a few months at a crown, and before

the year is out at half-a-crown. How well it pays 'one for waiting, besides enabling us to see what to buy !

We have bought seeds one season at ten shillings each, and the next might have bought them at sixpence ; we might have saved a good deal of money with a little patience.

In striking cuttings, bottom heat hastens the rooting, but it is in many cases not worth the trouble to apply it, because there is no object in hastening, and in some things it requires much more care and attention.

Want of light to plants makes them pale, want of air makes them draw up long and slender ; plants grown in the dark would be quite white.

The hearts of cabbages and lettuces are white, because their outer leaves keep them in the dark ; celery is white as far up the stems as the light is kept away by earthing them up.

Seeds always keep better in their pods than threshed out, and for private use should always be so kept, if the nature of the pods will allow of it.

Potatoes can be grown from struck cuttings, and to rapidly propagate any particularly rare sort, it may be done ; lay the tuber in a hot-bed, and as fast as the eyes send out shoots an inch long, pinch or pull them out, pot them, and place them in a hot-bed. You get many plants from one tuber ; plant them in the ground in May.

The side shoots of cabbage and of lettuce may be pulled off, struck, and grown, and will often produce as good heads as the parent did.

Cabbage Sprouts :—if after cutting the cabbage, and the sprouts begin to grow, you pull off all but the best one, and fresh earth them up, the second crop of cabbages will be quite as good as the first, and nearly as large.

The lighting of fires to burn weeds on the windward side of an orchard, and making a great smoke that blows through the trees, is an excellent method of disturbing the grubs ; a whole orchard might be cleared in this way in windy weather, for the instant that smoke reaches the grub it rolls up and falls.

The best way to reduce the vigour of a tree and throw it into bearing, is to prune the roots ; it is far better than any other mode of hastening maturity, such as ringing the bark, or tying with ligatures, or unnatural thinning.

Beating the fruit off a walnut tree, breaks off a good deal of the wood, and is as good as pruning ; however, it is said, the more you beat them the better they bear ; they are certainly none the worse for a little beating.



THE PROGRESS OF WOOD ENGRAVING.

No branch of art has more rapidly advanced than wood-engraving. Formerly, great men, distinguished artists, refused to draw on wood, considering it derogatory to their rank and standing; and, as a natural consequence, unless an engraver could draw well himself, he had no fair chance of attaining any high degree of excellence. Of course, this prejudice gradually subsided, and persons

of some note condescended to draw on blocks of wood, for engravers on that material. Illustrated works, and pictorial newspapers and magazines, have increased of late years, and embellishment has become so necessary to meet the taste of the present age, that scarcely a periodical is attempted without an allowance of wood-engravings; and the press teems with volumes of all sizes, deriving their

chief interest from elaborate illustration. Rarely do we see the text and the engravings alike excellent: gladly do we recognise any exceptions. We have discovered one* that has escaped us some time, and we thank the authoress for a clever tale, founded on the popular superstitions of Ireland, embracing in the *dramatis personæ* the queens of three fairy courts, who use their various influences to shape the course of an infant born on Midsummer Eve, after the death of the father, and, therefore, among the earth-born daughters who can be claimed by the spirits of good or evil, and who are, therefore, ac-

cording to the Hibernian legends, changed, and fairy bantlings left in their places. Night-star, Honey-bell, and the Queen of the Kelpies, strive for their respective objects, and all were present, with their attendant people, at the "birth of the fatherless." Randy the Wood-cutter seems an intimate acquaintance of Night-star's fairies of the air, and Honey-bell's fairies of the earth, and sees all the antics of the little sprites, though invisible to others. The Kelpies have taken possession of a tub of water, and Randy upsets some blessed salt into it, and expels them, they rushing out of the house, vowing vengeance. The queens Night-



star and Honey-bell soon arrange their matters, and it is determined the infant shall be left with the mother. The tale, then, is the history of the infant's life: we trace her through infancy to girlhood and womanhood, struggling with the world, comforting her mother, and going about doing good, guarded and influenced by the fairies of earth and air, while occasional annoyances are caused by the Kelpies. It is not our purpose to go through the tale; but it may well be imagined that the introduction of the fairies has given fine opportunities to artists; and they have availed themselves of them. The title-page is emblematical of the tale, in the same way as the overture gives us a few outlines of the opera that is to follow. The Fairy Ring, by Frost,

is a beautiful composition, comprising thirty or forty figures, gracefully or naturally engaged in their moonlight revels. The Mother's Blessing, by Huskisson, is very pretty. The portrait by Paton is cleverly designed—the details highly appropriate. The Vision of the Wood-cutter, by MacIise, is grotesque, finely-conceived, and just as imaginary as might be expected, where the single-minded Irishman is surrounded by all the Lilliputian subjects of whole kingdoms, and he asleep as sound as a top. The Lake of Killarney, by Creswick, is one of the few we have selected as specimens of the landscape-engravings, and must speak for itself. A Shipwreck, by Stanfield, is a most striking subject, handled in a masterly way. A Painter's Studio, by Ward, is pretty; and a group by Paton, in which Randy is the principal figure, is excellent; and equally deserving notice, for its

* Midsummer Eve: a Fairy Tale. By Mrs. S. C. Hall. Longmans, London.

ZEPHYRANTHES ATAMASCO, *Herbert* (Atamasco Lily).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant, with narrow strap-shaped leaves, and a stem about six or eight inches high, supporting a large solitary flower, which is somewhat funnel-shaped, of six segments, red at first, but white when fully expanded. A native of North America, in pastures in Virginia and Carolina. Introduced in 1629. Flowers in May and June. This is the *Amaryllis Atamasco* (Linnaeus). *Culture*.—Hardy; requires a sandy loam, good drainage, and perfect rest in winter; propagated by offsets, or seeds.

CRASSULA LACTEA, *Aiton* (milk-coloured *Crassula*).—*Crassulacææ* § *Crassulææ*.—A succulent shrubby plant, rising a foot or more high, much-branched, with opposite ovate fleshy leaves dotted with white on the upper side; the branches are terminated by dense panicles of starry white flowers, composed of five sharp segments. A native of the Cape of Good Hope. Introduced in 1774. Flowers in September and October. *Culture*.—Requires a greenhouse; loam and lime-rubbish; perfect drainage, and little water in winter; propagated by cuttings, somewhat dried before they are potted.

ALSTRÖMERIA PEREGRINA, *var. Errembaultii* (Errembault's *Alströmeria*).—*Amaryllidaceææ* § *Alströmeriææ*.—A herbaceous plant, with tuberous roots, smooth stems, growing about eighteen inches high, furnished with lance-shaped glaucous leaves; the flowers, which grow several together, are arranged like an umbel at the top of the stem; they are large, nearly three inches in diameter, nearly white, with the interior painted of a delicate rose colour, and beautifully spotted and streaked with purple, each division slightly tipped with green. A Belgian hybrid. Introduced before 1840. Flowers in August and September. *Culture*.—Requires a frame or greenhouse; sandy loam; propagated by division of the plant.

PORTULACA THELLUSONII, *Lindley* (Thelluson's *Portulaca*).—*Portulacææ*.—A small annual (or biennial) plant, with deep pink branching stems, a foot or more high, bearing a few alternate fleshy nearly cylindrical leaves, having in the axils a tuft of white filamentous hairs; the flowers come one or more at the apex of the branches, and consist of five ovate obtuse concave petals, forming a blossom nearly three inches in diameter, and of a brilliant crimson colour. Probably a native of America. Introduced in 1839. Flowers in June and July. Also called *P. grandiflora rutila* (Lindley). *Culture*.—Half-hardy, that is, should be grown in pots, or in the greenhouse, or in summer planted out in a dry warm corner; loam, peat, and sand; pro-

pagated by cuttings or seeds, and also by the fleshy leaves, which, if allowed to lie on the soil when they have fallen off, soon take root.

HABRANTHUS HESPERIUS, *var. advena* (strange western *Habranth*).—*Amaryllidaceææ* § *Amaryllæææ*.—A small bulb with glaucous channelled strap-shaped leaves a quarter of an inch wide, and a stem rising about six inches high, crowned with from two to six largish flowers, which are trumpet-shaped, composed of six segments, of a red colour upwards, but yellowish green at the base. A native of Chili, in dry places. Introduced in 1807. Flowers in May and June. Known also as *Amaryllis advena* (Ker). *Culture*.—Nearly hardy; requires a hot dry place, sandy loam, plenty of water while growing, and perfect rest afterwards; propagated by offsets or seeds.

GENTIANA VERNA, *Linnaeus* (spring *Gentian*).—*Gentianacææ* § *Gentianæææ*.—A little evergreen herbaceous perennial, with short trailing stems, clothed with opposite ovate leaves, and bearing large solitary flowers at the ends of the branches; the flowers have a tube nearly an inch long, surmounted by a spreading border cut into five segments, of a brilliant blue colour. Native of the Alps and Pyrenees, and also of Wales and Ireland. Flowers in April and May. *Culture*.—Hardy; requires a moist fibrous loam in not too exposed a situation; propagated by parting the roots early in autumn, or by seed.

HIPPEASTRUM STYLOSUM, *Herbert* (long-styled *Hippeastrum*).—*Amaryllidaceæææ* § *Amaryllææææ*.—A bulbous plant with long strap-shaped glossy leaves and a stout flower-stem, bearing two or more flowers at the top; the flowers have a short twisted greenish tube, and are divided into six segments of a dull coppery flesh colour. A native of Brazil, near Maranham. Introduced in 1821. Flowers in May and June. Known also by the name of *Amaryllis maranensis* (Ker). *Culture*.—Requires a stove; rich loam, perfect drainage, and rest when dormant; propagated by offsets or seeds.

HIPPEASTRUM REGIUM, *Herbert* (the Queen's *Hippeastrum*).—*Amaryllidaceæææ* § *Amaryllææææ*.—A bulbous plant with green strap-shaped leaves, and a stout flower-stem bearing three or more flowers on the top; the flowers are tubed, three inches or more long, divided into six segments, funnel-shaped, scarlet, with a green star at the base. Said to be a native of Mexico and Guatemala. Introduced in 1725. Flowers in May and June. Also known as *Amaryllis reginæ* (Linnaeus). *Culture*.—Requires a stove; strong loam, good drainage, and perfect rest in winter; propagated by offsets and seeds.

MARCEZIA DECUSSATA, *De Candolle* (cross-leaved *Marcetia*).—*Melastomacæææ* § *Melastomææææ*.

connected with Horticultural literature, inasmuch as many subjects can only be explained with the aid of such illustrations. Notwithstanding, therefore, that fairy tales and gardening have but little in common, we gladly

devote a few pages to Mrs. Hall's delightful volume, teeming, as it does, with the most splendid specimens of wood-engravings, every one of which is a gem, both in design and execution.



THE
Progress of Gardening.

It would be a curious inquiry how the art of tilling the ground commenced; by what steps it advanced, and whether the art of gardening ever did, in the olden days, become a profession, or merely by degrees fell into the hands of the industrious, while the idle went back into ignorance. Gardening, it is certain, ought never to have been a science confined to a class; every man ought to have been taught the best means of working the ground for the production of crops, as surely as he was taught to speak; and we maintain now, that it should form one of the earliest lessons that should be instilled into the mind of a youth. There is nothing more natural than that we should be thrown upon the earth for our resources, so that we ought to know how to make it fruitful, and we should be early made acquainted with the best means of applying our labour profitably. It was one of the most mistaken notions in the world, that a man should be brought up to any kind of occupation, without knowing how to act up to the great lesson taught mankind, that he should live upon the fruits of the earth. But all ideas of education have been at times concentrated in the mere notions of children talking after the manner of their parents, and doing any kind of drudgery, rather than the most important of all practical lessons, the best mode of treating the earth that is to provide our food. Gardening has for many years been called a profession; there have

been hundreds attain some degree of notoriety for the management of the ground, and the cultivation of it to advantage. There are hundreds of thousands, perhaps millions, who, if they were turned loose on the finest tract of land in the world, would be so thoroughly ignorant of even the first principles of tillage, as to render the ground worthless to them for every thing beyond the wild fruits and vegetables that might be picked up from its surface. This should not be; we maintain that every school, from those to which infants are first sent, to those conferring the highest degrees, should enforce at least so much of the practical knowledge of gardening as might enable a man to till the earth,—to sow, reap, plant, gather, and do the ordinary work of a gardener. Those who wish to pursue the art to the best use of artificial means may do so, but they should all know how to grow hardy vegetables, as clearly and as plainly as they know how to talk. The publication of Abercrombie's "Own Gardener" was the result of a happy thought, and it has done more to teach men than all the other works and other means combined. The establishment of a Gardener's Gazette, in 1837, followed up the design in good earnest; and now, the many works that issue from the press, in all shapes, of all sizes and prices, are carrying all before them in the design of teaching all men gardening. There must be no mystery in these plain and homely duties; when a boy is old

enough to reason, he must be made to understand digging, ploughing, sowing, reaping, and all the ordinary operations of farming and gardening, whether he be designed for any particular line of life or otherwise. Every man ought to know it, the better to fit him for every grade of life up to the legislator, whose very qualification is that he shall possess land to a certain extent; for if he knows not how to manage it, he will be a poor legislator on subjects that affect the landed interest, and all the labourers upon it. The man who can turn up a rod of ground, sow it well, manage it well, and even reap it and thrash the produce, is the best man for any situation in life, for he alone can duly appreciate the bread he eats, the vegetables that he consumes, and the meat which has fed from the produce of the land. There must henceforth be a general education in the rudiments and principles of gardening. It is adopted at many schools; adults are rapidly making themselves masters of the art or science; thousands of florists greatly excel professional gardeners in the production of first-rate flowers, and these, be it remembered, have for the most part learned it after everything else, after they had perfected themselves in their own trade or calling; and if these can succeed after imbibing the many prejudices which are inseparable from mechanical and artistic knowledge, how much more successful would they have been, had the first principles been taught them while at school, or even while under their parents' roof! There are innumerable arguments in favour of early education in gardening. Tens of thousands of emigrants have been unable to avail themselves of the finest opportunities, because they did not understand how to make the best use of land; and in our own country, until recently, that is, the last half century, our cottage gardens were for the most part neglected from sheer ignorance of the knowledge necessary for the proper application of the labour at command. We would have, as the late King George III. said, "Every man able to read his Bible;" but we would also have every man able to cultivate his garden, that his children, as they grow up, should have the same knowledge, and be enabled to act usefully almost as soon as they have done lisping, from the mere example of their parents. There is nothing in gardening that a very common man may not learn very soon. Thousands of our very best gardeners, and writers on gardening, are or were amateurs. Many of the principal nurserymen and florists by profession were but amateurs; many of them brought up to, and pursued, other callings, but have followed gardening because there was more profit attached to it, and because they had been

victimized in their purchases of garden produce by others, who made a great mystery of nothing. There is not in the wide range of human attainments anything more useful to man than the knowledge of the culture of the earth, and the management of the animals that live upon it; nor more useful to woman than the art of appropriating and cooking the produce. The neglect in young women's education, of that essential knowledge of cooking and household work which must be done, is not more remarkable than that of the ignorance of young men as to the management of the ground, so as to bring forth its fruits. The mistaken notion that both young ladies and young gentlemen are sure not to want it, is almost unpardonable. No lady so fit to command respect as her whose knowledge of what she orders to be done, enables her to order nothing inconsistent; nor can any man be so fitted for all the situations of life as him who from practical experience can tell what the ground ought to produce, and how it may be best made to produce it. It is a pitiable truth, that the ignorance of the higher classes of females as to household affairs lays them open to the grossest impositions; while many gentlemen are scarcely more fortunate with regard to their garden establishments. One-half the gardeners in place were never brought up to the business or profession, but have taken to it naturally; and these men, freed from the trammels of the profession, are sometimes valuable servants, while others, with double the advantages, are comparatively useless; hence the necessity, or at any rate the advantage, of gentlemen making themselves acquainted with gardening matters, if only for the purpose of seeing that their own establishments are properly and not too expensively managed. All we have to do here, however, is to enforce the necessity of teaching every schoolboy the rudiments of farming and gardening, and make him practise the ordinary operations of both. Let it be previous to, or simultaneous with his spelling, reading, arithmetic, and writing. If when he has done his education he be moving in a higher sphere, he will treasure his knowledge of mother earth and her capabilities; if he be destined for labour, he has the most useful at his finger ends; if for a tradesman, he is none the worse for the knowledge he has acquired; while if he be able to keep up an establishment, and employ men to labour in his fields or gardens, he will be able to see whether justice is done to his land and to himself. To carry out this object, some acknowledged school-book should be adopted, or, if you please, have as many gardening books as there are different spelling books; let all who fancy they can do some-

thing for the guidance of youth do it at once. Let every preparatory school have its spelling book, or its additions or supplements to ordinary spelling books, to be placed in the hand of a child as soon as he is advanced far enough to comprehend the words to be spelled and explained. Let the operation of digging be performed before the whole school on particular days; let those who are old enough be allowed to assist, and be taught how to do it properly. Let them be examined in classes upon the subject of the various operations, and all the general principles on which such operations are founded. They will turn out better men for every station in life, from their well grounded knowledge as to the leading operations in the management of the ground. It is a humiliating thing to find even our senators presuming to enact laws that shall affect land, landlords, tenants, and labourers, yet totally ignorant of the relative condition of any one of them—wholly unacquainted with the nature of the work to be performed by one, the duties to be observed by another, the condition of the third, or the privileges of the fourth. Common sense tells us that he

who knows nothing of labour should be mute when the question of labour and its rights is discussed; he who is ignorant of what can be done with land, and how it can be made the best of, should be decently silent when subjects wholly dependent on them are under consideration. Yet we have men filling the highest offices of state, confessing their utter ignorance of those duties, and of that useful knowledge which they should have learned with their first lessons; smiling, in fact, at their own want of information, and glorying that they know nothing of menial work. Truly, the man of the people, taken from the plough-tail to govern, was a noble, compared with the superficial upstarts that legislate for the working classes, without knowing any of the facts upon which alone just legislation can be based. Let Agriculture and Horticulture, plain, practical, and useful agriculture and horticulture, without any of the mysteries and theories with which scientific blockheads have surrounded them, be the youths' early and well-grounded lessons, and they will be better and more useful men for their attainment.

NOTES ON FLOWERS AND FLOWERING PLANTS.

ALSTRÖMERIA AUREA, *Graham* (golden-flowered *Alströmeria*).—*Amarylhidaceæ* § *Alströmeriæ*.—A tuberous-rooted plant with annual stems, rising three feet high, furnished with twisted smooth leaves, and crowned by a cluster of from ten to fifteen largish flowers, which are composed of six upright segments, spreading at top, of a golden yellow colour, the two uppermost streaked with red. A native of the island of Chiloe, and of the southern parts of Chili. Introduced in 1831 (?). Flowers in July and August. *Culture*.—Hardy, succeeding well in free loam; propagated by division of the root, and by seeds, which are ripened abundantly.

ALSTRÖMERIA HÆMANtha, *var. Simsiana* (Sims's blood-flowered *Alströmeria*).—*Amarylhidaceæ* § *Alströmeriæ*.—A tuberous-rooted plant, with annual stems, rising from two to three feet high, bearing smooth leaves edged with hairs, and terminated by from fifteen to twenty flowers, each of six segments, two of which are much shorter than the others; the general colour is bright red, with yellow and red patches. A native of Chili and Peru. Introduced in 1822. Flowers from June to September. Generally known as *Alströmeria pulchella* (Sims). *Culture*.—Hardy, requiring little or no protection in winter; light loam; propagates readily by division of the roots, or by seeds.

GALEANDRA DEVONIANA, *Lindley* (Duke of Devonshire's *Galeandra*).—*Orchidaceæ* § *Vandææ-Sarcanthidæ*.—An epiphytal plant with

an erect stem, attaining two or three feet high, and furnished with a few alternate lance-shaped leaves, bearing at the top a few singular blossoms, of which the sepals and petals are nearly uniform, lance-shaped, of a brownish green colour, and bent back, and the lip large and prominent, ovate and crenulated, white marked by pink longitudinal and transverse lines; the lip is prolonged behind into a spur. A native of South America, on the banks of the Rio Negro, a tributary of the Amazon river. Introduced in 1839. Flowers from May to August. *Culture*.—Requires a stove, and to be potted among turfy peat and charcoal; propagated by dividing the plant.

EPACRIS IMPRESSA, *Cavanilles* (pitted *Epacris*).—*Epacridaceæ* § *Epacresæ*.—A small and slender shrub, flowering when a foot or so in height, but growing five or six feet, or more; the long slender branches thickly scattered over with narrow lance-shaped rigid leaves, and for a great part of their length, when a year old, furnished thickly with pendent tubular pink flowers, cut at the end into five spreading segments; these flowers grow—sometimes singly, sometimes two together—from the axils of the leaves. A native of New South Wales. Introduced in 1824. Flowers from March to May. *Culture*.—Requires a greenhouse; turfy peat soil; propagated by cuttings (the tops of young shoots) planted in sand under bell glasses, and set in a very slight heat.

MARCTIA DECUSSATA, *De Candolle* (cross-leaved Marctia).—Melastomaceæ & Melas-

tomea-*Rhexia*.—A small erect neat shrub, with a much-branched stem, opposite small ovate leaves ranged crosswise on the stem, and numerous small flowers singly in the axils of the leaves, rose-coloured, having four small spreading petals of an ovate lance-shaped figure, with eight projecting stamens. A native of Brazil, in the province of Bahia, at an elevation of 2,000 feet. Introduced in 1839. Flowers from August to October. Also called *Rhexia decussata* (Martius). *Culture*.—Requires a warm greenhouse; light sandy soil; propagated by cuttings in slight heat.

TRIPTILION SPINOSUM, *Ruiz and Pavon* (spiny *Triptilion*).—*Asteraceae* § *Labiati-florea*-*Nassavieae*.—A beautiful herbaceous plant, with numerous slender stems growing two feet high, with small scattered leaves deeply cut into linear segments, with a long stiff spinous point; the stems are terminated by a crowded corymb of small flowers of five roundish oval florets, deep blue, so enduring as to be retained long after they are gathered; the smaller inner lip of the florets is pale yellow. A native of Chili. Introduced in 1827. Flowers in June and July. *Culture*.—Requires a cool greenhouse, or dry frame; should be potted after flowering, in sandy loam and leaf mould; propagated by division of the plant.

TROPÆOLUM MORITZIANUM, *Link, &c.* (Moritz's Indian Cross).—*Tropæolaceae* § *Tropæoleae*.—A pretty climbing plant, with large tuberous roots, long slender branching stems, alternate roundish kidney-shaped leaves, slightly lobed, straight along the base, and peltate, that is, with footstalks attached behind: the flowers grow singly, one from each axil on long stalks, and consist of a calyx of five ovate lanceolate yellowish red segments, a corolla of five wedge-shaped fringed orange-red petals, and a funnel-shaped spur behind. A native of Cumana. Introduced in 1839. Flowers from May to October. *Culture*.—Requires a greenhouse; light loamy soil; propagated by cuttings in slight heat, or by seeds. Succeeds also in a warm spot, in dry soil, in the flower-garden, during summer.

ODONTOGLOSSUM ROSSII, *Lindley* (Ross's Tooth-tongue).—*Orchidaceae* § *Vandee*-*Brasidae*.—A handsome small epiphytal plant, with ovate compressed pseudo-bulbs, from the top of which arise the lance-shaped leaves, and erect flower-stem bearing two or three flowers; the sepals are spreading and incurved, lance-shaped, greenish brown, handsomely banded and spotted with brown; the petals are white, nearly ovate, and blotched with brown at the base; the lip also white, roundish, and undulated. A native of Mexico. Introduced in 1838. Flowers in August. *Culture*.—Requires a cool stove, and may be

potted or planted on a block of wood; propagated by division of the plant. Suitable for a Wardian case.

CYRTANTHUS STRIATUS, *Herbert* (striped-flowered *Cyrtanthus*).—*Amaryllidaceae* § *Amaryllae*.—A bulbous plant, with leaves about a foot in length and half an inch wide, speckled with red below; the flower-stem is surmounted by three or four pendulous funnel-shaped flowers, each about two inches and a half long, divided at the mouth into six segments, and of a red colour striped with yellow. A native of the Cape of Good Hope. Introduced in 1823 (?). Flowers in July. *Culture*.—Requires an airy dry stove, free loam, and little or no water after the leaves die down; propagated by offsets or seeds, but generally imported, as it is difficult to keep.

CYRTANTHUS ANGUSTIFOLIUS, *Willdenow* (narrow-leaved *Cyrtanthus*).—*Amaryllidaceae* § *Amaryllae*.—A bulbous-rooted plant, with long strap-shaped leaves about a quarter of an inch wide, red at the base; the flower-stalk is surmounted by four or five flowers drooping to one side; they are narrow funnel-shaped, and of an orange-red colour, divided at the mouth into six segments. A native of the Cape of Good Hope. Introduced in 1774. Flowers in May and June. *Culture*.—Requires an airy dry stove, free loam, and perfect rest after the leaves decay; propagated by offsets and seeds.

ZEPHYRANTHES LINDLEYANA, *Herbert* (Lindley's *Zephyranth*).—*Amaryllidaceae* § *Amaryllae*.—A small bulbous plant, with very narrow strap-shaped leaves, and a stem about three inches high, with one flower on the top; the flower is funnel-shaped, about an inch long, divided into six segments, of a pale rose colour, with a green base. A native of Mexico. Introduced in 1825. Flowers in May. Supposed to be the *Amaryllis minata* (Humboldt). *Culture*.—Requires a greenhouse, light sandy loam, a liberal supply of water in the growing season, and perfect rest in winter; propagated by offsets or seeds.

PARNASSIA CAROLINIANA, *Michaux* (Carolina Grass of *Parnassus*).—*Hypericaceae* § *Elo-deae*.—A herbaceous perennial, with a tuft of leaves, which are nearly round, about an inch and a half across, with a stalk about the same length, and throwing up leafless stems nearly a foot high, each terminated by a large solitary flower, which is about an inch across, composed of five ovate segments, white, strongly veined with green. A native of bogs in North Carolina. Introduced in 1802. Flowers in June and July. *Culture*.—Nearly hardy; requires a boggy soil, and slight protection in winter; propagated by division of the roots.

AQUILEGIA GLANDULOSA, *Fischer* (glandu-

lar Columbine).—*Ranunculaceæ* § *Helleborææ*.—A beautiful herbaceous perennial, growing from a foot to eighteen inches high, with a tuft of radical roots which are biternate, that is twice divided into three; the segments are roundish, deeply lobed; the flowers, which grow at the top of the stem, are large and drooping, and consist of five oval oblong deep blue sepals (in vigorous specimens measuring four inches across); the petals are white, with a crooked spur at the base, and bluntly obovate at the top. A native of the alpine regions of the Altaia mountains. Introduced in 1822. Flowers from May to July. *Culture*.—Hurdy; should be sown in autumn, and when eighteen months old removed to a soil of sandy loam and leaf mould; propagated by seeds, and division of the plant.

RUSSELLIA JUNCEA, *Zuccarini* (rushy branched *Russelia*).—*Scrophulariaceæ* § *Antirrhinidææ*—*Chelonææ*.—A showy much-branched plant, with very numerous slender four-angled stems branching in whorls; the strong shoots grow at first upwards, but as they extend, become altogether drooping, in which condition the plant is generally seen, forming a dense mass of slender drooping rush-like stems, which appear almost leafless, and at the proper time are profusely flowered; the leaves are small and linear; the flowers are tubular, about an inch long, five cleft at the end, and of a bright crimson colour. A native of Mexico. Introduced in 1833 (?). Flowers from June to August. Probably the *Russelia equisetiformis* (Chamisso and Schlechtendahl). *Culture*.—Requires a cool stove or warm greenhouse; turfy peat soil; propagated by cuttings in sand in a slight heat.

HIPPEASTRUM PEITACINUM, *Herbert* (parrot *Hippeastrum*).—*Amaryllidaceæ* § *Amaryllææ*.—A bulbous plant with long strap-shaped leaves about an inch and a half wide, with a stout flower-stalk bearing two flowers at the summit, which are slightly tubular; divided into six rather spreading segments, the three outermost being the broadest; they are green, striped and edged with bright red. A native of Brazil. Introduced in 1816. Flowers from May to August. Known also as *Amaryllis peitacina* (Ker). *Culture*.—Requires a stove; strong loam, and good drainage, and careful watering in winter; propagated by offsets or seeds.

HIPPEASTRUM SOLANDRIFLORUM, *Herbert* (*Solandra*-flowered *Hippeastrum*).—*Amaryllidaceæ* § *Amaryllææ*.—A bulbous plant with long strap-shaped leaves nearly two inches broad, and a stout flower stem rising three feet high, supporting a few large flowers, (which are eight inches long) tubular with six spreading segments, of a yellowish white

colour marked with green. Native of South America. Introduced in 1820. Flowers in April. Also known as *Amaryllis Solandra-flora* (Lindley). *Culture*.—Requires a stove; strong loam, good drainage, and careful watering at all seasons; propagated by offsets or seeds, sporting much when hybridized.

ALSTRÖMERIA CARTOPHYLLÆA, *Jacquin* (clove-scented *Alströmeria*).—*Amaryllidaceæ* § *Alströmeriææ*.—A tuberous-rooted plant, sending up scaly stems two or three feet high, furnished with a few large flowers at the top; barren stems are also thrown up, which are furnished with narrow leaves; the flowers are composed of six segments, the upper ones much the largest, crimson tipped with white, the inner one being white, lined and speckled with red. A native of Brazil. Introduced in 1776. Flowers in March and April, or later. Commonly known as *Alströmeria Light*, from having been so figured by Curtis; but not the plant of Feuille. *Culture*.—Requires to be grown freely in heat, and well rested when the stalks die down; light sandy loam; propagated by division of the roots, or by seeds.

ALSTRÖMERIA PEREGRINA, *Herbert* (foreign *Alströmeria*).—*Amaryllidaceæ* § *Alströmeriææ*.—A tuberous rooted plant, sending up annual stems about two feet high, furnished with scattered fleshy twisted glaucous leaves, and bearing a few large flowers at the summit; the flowers are somewhat trumpet-shaped, composed of six segments, white or bluish, with crimson and orange blotches. A native of Chili. Introduced in 1753. Flowers from June to September. Known also by the name of *Alströmeria peregrina* (Feuille). *Culture*.—Hardy, in a dry warm situation; free loam and leaf mould; propagated by division of the roots and by seeds.

ZEPHYRANTHES TUBISPATHA, *var. hybrida* (hybrid tube-spated *Zephyranth*).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant with narrow strap-shaped leaves, and a stem of six or eight inches high supporting a large solitary flower, which is of a spreading funnel-shape, and consists of six segments, of a pretty pink colour. A hybrid variety raised by the Dean of Manchester about 1833. Flowers in May and June. Also known as *Z. Spofforthiana* (Lindley). *Culture*.—Requires a greenhouse; sandy loam, and perfect rest in winter; propagated by offsets.

GENTIANA SEPTEMFIDA, *Pallas* (seven-cleft flowered *Gentian*).—*Gentianaceæ* § *Gentianææ*.—An herbaceous perennial with stems rising nearly a foot high, thickly furnished with opposite lance-shaped leaves, and terminated by from two to six large flowers, which are tubular, about two inches long, divided into from five to seven segments, spreading at the

mouth, where they are also fringed; the colour is deep blue. A native of the Crimea, and of alpine situations thence to Persia. Introduced in 1804. Flowers in June and July. *Culture*.—Hardy; requires a mixture of loam and bog; propagated by division of the root.

SENECIO POPULIFOLIUS, *De Candolle* (popular leaved Senecio).—*Asteraceæ* § *Tubulifloræ*-*Senecionææ*.—A half shrubby erect growing plant attaining three to four feet high, clothed with close white wool, and having alternate cordate-ovate, angulated leaves, covered on the under side with dense soft white wool. The flowers grow in large corymbose panicles at the end of the branches, and are large, daisy-like, and numerous; the disk is purplish, and the ray white tipped with delicate purple-lilac. A native of the Canary Islands. Introduced in 1780, and probably the parent of many of our half-shrubby cultivated *Cinerarias*. Flowers from June to September. It is also called *Cineraria populifolia* (L'Heritier). *Culture*.—Requires a greenhouse or frame in winter, grows out-doors in summer; light rich loam; propagated freely by cuttings in slight heat.

EPIDENDRUM UMBELLATUM, *Swartz* (umbel-flowered Epidendrum).—*Orchidaceæ* § *Epidendrææ*-*Læliadææ*.—A small epiphytal plant, with numerous unbranched stems, alternate, distichous, leathery, oblong leaves, and umbels of small greenish coloured flowers terminating the stems; these flowers are of a waxy appearance, not very showy, and scented, but the scent is hardly agreeable. A native of Jamaica. Introduced in 1793. Flowers in June and July. Called also *E. difforme* (Jacquin), and probably the same as *E. corymbosum* (Ruiz and Pavon). *Culture*.—Requires a moist stove, and the usual treatment of orchids; propagated by division of the plant.

HABRANTHUS BAGNOLDIANUS, *Herbert* (Mr. Bagnold's Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A bulbous plant with large black bulbs, long strap-shaped glaucous leaves, and a green stem rising six or more inches high, crowned by about six large flowers, which are about two inches long, trumpet-shaped, divided into six segments, of a yellow colour, spotted inside with red. A native of Chili, near Coquimbo, in dry gravelly places. Introduced in 1829. Flowers in October and November. *Culture*.—Nearly hardy, but better kept in a well drained pot; sandy loam, plenty of water when growing, and perfect rest afterwards; propagated by offsets or seeds.

GENTIANA ASCLEPIADEA, *Linnaeus* (Asclepias-like Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial with stems rising nearly eighteen inches high, having

opposite pointed somewhat heart-shaped leaves, and a dense spike of large flowers at top; the flowers are bell-shaped, about two inches long, divided at the mouth into five segments, and of an intensely deep blue colour. A native of Europe in moist shady places. Introduced before 1629. Flowers in July and August. *Culture*.—Hardy; prefers a moist loamy soil in a sheltered spot; propagated by division of the roots, or by cuttings of the same parts.

HABRANTHUS HESPERIUS, *var. miniatus* (red-flowered western Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant with narrow strap-shaped leaves about a quarter of an inch wide, and a stem about eight inches high, bearing from two to five or more flowers at top; the flowers are about two inches long, of six acute segments, trumpet-shaped, and of a brick-red colour. A native of Chili, near Valparaiso. Introduced in 1832. Flowers in July. *Culture*.—Nearly hardy; requires a hot dry place, free loam, abundant moisture while growing, and complete rest afterwards; propagated by offsets or seeds.

GENTIANA MACROPHYLLA, *Pallas* (large-leaved Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial with a stem nearly a foot high, bearing a few long leaves at the summit; the root leaves are as long as the stem, and lance-shaped; the flowers are crowded into a dense head on the top of the stem, tubular, generally with four short spreading segments of an intense blue colour inside. Native of eastern Siberia, common in pastures. Introduced in 1796. Flowers in June and July. *Culture*.—Hardy; prefers a moist loam; propagated by seeds, or division of the root.

LOBELIA CAVANILLESII, *Roemer and Schultes* (Cavanilles' Lobelia).—*Lobeliaceæ* § *Lobeleææ*.—An erect-growing plant, with stems attaining four feet in height, narrow lance-shaped leaves three to four inches long, and flowers produced singly in the axils on stalks which curve downwards, and are as long as the leaves: the flowers are tubular, slit along the upper side, and two-lipped, the upper lip consisting of two acute segments, the lower one oblong and three-toothed; they are red on the upper side, but yellow below and within. A native of Mexico, near Acacampo. Introduced in 1825. Flowers in July and August. Also called *Lobelia persicifolia* (Cavanilles), and *Siphocampylus Cavanillesii* (garden name). *Culture*.—Suitable for growing in pots for autumn and winter blooming in the greenhouse; rich loamy soil; propagated by cuttings in gentle heat.

GENISTA BRACTEOLATA, *Link* (racemose Genista).—*Fabaceæ* (*Leguminosæ*) § *Papilionaceæ*-*Genistææ*.—A free-growing shrubby

plant, with spreading branches, covered, as well as the leaves, with short silky hairs; the leaves are trifoliate, with obovate lance-shaped leaflets; and the flowers are borne in racemes from almost every lateral branch, yellow, butterfly-shaped, and very sweet scented. A native of the Canary Islands. Introduced in 1823. Flowers throughout the spring months, often in winter. Also known in gardens as *Cytisus racemosus* (garden name). *Culture*.—Requires a greenhouse; rich loamy soil, and plenty of pot-room; propagated by cuttings in gentle heat.

HABRANTHUS HESPERIUS, *var. pallidus* (pale-flowered western Habranth).—*Amaryllidaceæ* § *Amaryllæ*.—A small bulbous plant, with glaucous, blunt, strap-shaped leaves, and a stem rising about six inches high, supporting from two to seven flowers on the top; the flowers are large, of six segments, trumpet-shaped, varying in colour from white to pale yellow, sometimes tinged with red. A native of Chili, near Valparaíso, in dry gravelly places. Introduced in 1821. Flowers in May and June. Also known as *Amaryllis advena var. cerina* (Lindley). *Culture*.—Nearly hardy; requires a hot dry place, free loam, plenty of water while growing, and complete rest afterwards; propagated by offsets or seeds.

GENTIANA ACAULIS, *Linnaeus* (stemless Gentian, or Gentianella).—*Gentianaceæ* § *Gentianæ*.—A dwarf evergreen herbaceous perennial, seldom more than four inches high, with broad somewhat heart-shaped leaves, of a deep green colour; the flower is solitary, bell-shaped, nearly three inches long, with the top spreading in five broad segments of an intense blue colour, the tube of a paler colour, with dark spots. A native of the mountains of Europe. Grown by Parkinson before 1629; wrongly said to be indigenous in Wales. Flowers in April and May. *Culture*.—Perfectly hardy; flourishing best in deep moist loam; propagated by parting its roots in autumn, or by seed.

HABRANTHUS VERSICOLOR, *Herbert* (changeable-flowered Habranth).—*Amaryllidaceæ* § *Amaryllæ*.—A small bulbous plant, with strap-shaped leaves a foot long and a quarter of an inch wide, and a stem about six inches high, bearing a solitary flower about two inches long, trumpet-shaped, of six segments, white tinged with pink and tipped with red. A native of South America. Introduced in 1821. Flowers in September. *Culture*.—Nearly hardy; requires free loam, complete drainage, plenty of water whilst growing, and perfect rest afterwards; propagated by offsets or seeds.

PERIPLOCA GRÆCA, *Linnaeus* (Grecian Periploca).—*Asclepiadaceæ* § *Periplocæ*—

A woody climbing plant, growing to a length of thirty or forty feet, with opposite broadly-lanceolate leaves, about three inches long; the flowers are produced in considerable bunches at the ends of the branches; they are about one inch across, cut in five segments, hairy, and of a deep dull purple colour, edged with green. A native of Asia Minor and the Grecian Archipelago. Introduced in 1597. Flowers in July and August. *Culture*.—Perfectly hardy; growing freely in common soil; propagated by layers in the open ground.

HABRANTHUS ANDERSONIANUS, *Herbert* (Anderson's Habranth).—*Amaryllidaceæ* § *Amaryllæ*.—A small bulbous plant, with narrow, strap-shaped, sharp-pointed leaves, and a stem rising about six inches high, bearing one flower, which is divided into six segments, drooping, with the lowest segments shortest, varying in colour from that of gold to copper, and streaked more or less with reddish brown. Native of Buenos Ayres. Introduced in 1829. Flowers in May and June. *Culture*.—Nearly hardy; requires a loamy soil, good drainage, and perfect rest when not growing; propagated by offsets or by seed.

GENTIANA SAPONARIA, *Linnaeus* (soapwort leaved Gentian).—*Gentianaceæ* § *Gentianæ*.—A herbaceous perennial, with stems above a foot high, and opposite, lance-shaped, strongly-nerved leaves; the flowers are produced in the axils of the leaves, being crowded towards the tops of the shoots; they are large, barrel-shaped, never expanding, more than an inch long, of a very deep blue colour. A native of North America, in open grassy places in woods. Introduced in 1776. Flowers in August and September. *Culture*.—Hardy; requires a mixture of loam and bog, and a shady situation; propagated by division of the root.

ALSTRÖMERIA PEREGRINA, *var. flore alba* (white-flowered foreign Alströmeria).—*Amaryllidaceæ* § *Alströmeriæ*.—A tuberous-rooted plant, with annual stems about two feet high, bearing scattered fleshy leaves, twisted in the middle, and furnished with a few large flowers at the top; the flowers are of six segments, somewhat trumpet-shaped, white, with green markings. A seedling variety, raised in England. *Culture*.—Nearly hardy; requires slight protection from frost; free light loam, and careful watering when in a dormant state; propagated by division of the root, and by seeds, which sport greatly.

ALSTRÖMERIA PULCHRA, *Sims* (fair Alströmeria).—*Amaryllidaceæ* § *Alströmeriæ*.—A tuberous-rooted plant, with annual stems rising two or three feet high, and bearing twisted light green leaves, and two or three

mouth, where they are also fringed; the colour is deep blue. A native of the Crimea, and of alpine situations thence to Persia. Introduced in 1804. Flowers in June and July. *Culture*.—Hardy; requires a mixture of loam and bog; propagated by division of the root.

SENECIO POPULIFOLIUS, *De Candolle* (popular leaved Senecio).—*Asteraceæ* § *Tubulifloræ*-*Senecionææ*.—A half shrubby erect growing plant attaining three to four feet high, clothed with close white wool, and having alternate cordate-ovate, angulated leaves, covered on the under side with dense soft white wool. The flowers grow in large corymbose panicles at the end of the branches, and are large, daisy-like, and numerous; the disk is purplish, and the ray white tipped with delicate purple-lilac. A native of the Canary Islands. Introduced in 1780, and probably the parent of many of our half-shrubby cultivated *Cinerarias*. Flowers from June to September. It is also called *Cineraria populifolia* (L'Heritier). *Culture*.—Requires a greenhouse or frame in winter, grows out-doors in summer; light rich loam; propagated freely by cuttings in slight heat.

EPIDENDRUM UMBELLATUM, *Swartz* (umbel-flowered Epidendrum).—*Orchidaceæ* § *Epidendrææ*-*Læliadææ*.—A small epiphytal plant, with numerous unbranched stems, alternate, distichous, leathery, oblong leaves, and umbels of small greenish coloured flowers terminating the stems; these flowers are of a waxy appearance, not very showy, and scented, but the scent is hardly agreeable. A native of Jamaica. Introduced in 1793. Flowers in June and July. Called also *E. difforme* (Jacquin), and probably the same as *E. corymbosum* (Ruiz and Pavon). *Culture*.—Requires a moist stove, and the usual treatment of orchids; propagated by division of the plant.

HABRANTHUS BAGNOLDIANUS, *Herbert* (Mr. Bagnold's Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A bulbous plant with large black bulbs, long strap-shaped glaucous leaves, and a green stem rising six or more inches high, crowned by about six large flowers, which are about two inches long, trumpet-shaped, divided into six segments, of a yellow colour, spotted inside with red. A native of Chili, near Coquimbo, in dry gravelly places. Introduced in 1829. Flowers in October and November. *Culture*.—Nearly hardy, but better kept in a well drained pot; sandy loam, plenty of water when growing, and perfect rest afterwards; propagated by offsets or seeds.

GENTIANA ASCLEPIADEA, *Linnaeus* (Asclepias-like Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial with stems rising nearly eighteen inches high, having

opposite pointed somewhat heart-shaped leaves, and a dense spike of large flowers at top; the flowers are bell-shaped, about two inches long, divided at the mouth into five segments, and of an intensely deep blue colour. A native of Europe in moist shady places. Introduced before 1629. Flowers in July and August.

Culture.—Hardy; prefers a moist loamy soil in a sheltered spot; propagated by division of the roots, or by cuttings of the same parts.

HABRANTHUS HESPERIUS, *var. miniatus* (red-flowered western Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant with narrow strap-shaped leaves about a quarter of an inch wide, and a stem about eight inches high, bearing from two to five or more flowers at top; the flowers are about two inches long, of six acute segments, trumpet-shaped, and of a brick-red colour. A native of Chili, near Valparaiso. Introduced in 1832. Flowers in July. *Culture*.—Nearly hardy; requires a hot dry place, free loam, abundant moisture while growing, and complete rest afterwards; propagated by offsets or seeds.

GENTIANA MACROPHYLLA, *Pallas* (large-leaved Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial with a stem nearly a foot high, bearing a few long leaves at the summit; the root leaves are as long as the stem, and lance-shaped; the flowers are crowded into a dense head on the top of the stem, tubular, generally with four short spreading segments of an intense blue colour inside. Native of eastern Siberia, common in pastures. Introduced in 1796. Flowers in June and July. *Culture*.—Hardy; prefers a moist loam; propagated by seeds, or division of the root.

LOBELIA CAVANILLESII, *Rosmer and Schultes* (Cavanilles' Lobelia).—*Lobeliaceæ* § *Lobelææ*.—An erect-growing plant, with stems attaining four feet in height, narrow lance-shaped leaves three to four inches long, and flowers produced singly in the axils on stalks which curve downwards, and are as long as the leaves: the flowers are tubular, slit along the upper side, and two-lipped, the upper lip consisting of two acute segments, the lower one oblong and three-toothed; they are red on the upper side, but yellow below and within. A native of Mexico, near Acacampo. Introduced in 1825. Flowers in July and August. Also called *Lobelia persicifolia* (Cavanilles), and *Siphocampylus Cavanillesii* (garden name). *Culture*.—Suitable for growing in pots for autumn and winter blooming in the greenhouse; rich loamy soil; propagated by cuttings in gentle heat.

GENISTA BRACKETOLATA, *Link* (racemose Genista).—*Fabaceæ* (*Leguminosæ*) § *Papilionaceæ*-*Genistææ*.—A free-growing shrubby

plant, with spreading branches, covered, as well as the leaves, with short silky hairs; the leaves are trifoliate, with obovate lance-shaped leaflets; and the flowers are borne in racemes from almost every lateral branch, yellow, butterfly-shaped, and very sweet scented. A native of the Canary Islands. Introduced in 1823. Flowers throughout the spring months, often in winter. Also known in gardens as *Cytisus racemosus* (garden name). *Culture*.—Requires a greenhouse; rich loamy soil, and plenty of pot-room; propagated by cuttings in gentle heat.

HABRANTHUS HESPERIUS, *var. pallidus* (pale-flowered western Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant, with glaucous, blunt, strap-shaped leaves, and a stem rising about six inches high, supporting from two to seven flowers on the top; the flowers are large, of six segments, trumpet-shaped, varying in colour from white to pale yellow, sometimes tinged with red. A native of Chili, near Valparaíso, in dry gravelly places. Introduced in 1821. Flowers in May and June. Also known as *Amaryllis advena var. cerina* (Lindley). *Culture*.—Nearly hardy; requires a hot dry place, free loam, plenty of water while growing, and complete rest afterwards; propagated by offsets or seeds.

GENTIANA ACAULIS, *Linnaeus* (stemless Gentian, or Gentianella).—*Gentianaceæ* § *Gentianææ*.—A dwarf evergreen herbaceous perennial, seldom more than four inches high, with broad somewhat heart-shaped leaves, of a deep green colour; the flower is solitary, bell-shaped, nearly three inches long, with the top spreading in five broad segments of an intense blue colour, the tube of a paler colour, with dark spots. A native of the mountains of Europe. Grown by Parkinson before 1629; wrongly said to be indigenous in Wales. Flowers in April and May. *Culture*.—Perfectly hardy; flourishing best in deep moist loam; propagated by parting its roots in autumn, or by seed.

HABRANTHUS VERSICOLOR, *Herbert* (changeable-flowered Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant, with strap-shaped leaves a foot long and a quarter of an inch wide, and a stem about six inches high, bearing a solitary flower about two inches long, trumpet-shaped, of six segments, white tinged with pink and tipped with red. A native of South America. Introduced in 1821. Flowers in September. *Culture*.—Nearly hardy; requires free loam, complete drainage, plenty of water whilst growing, and perfect rest afterwards; propagated by offsets or seeds.

PERIPLOCA GRÆCA, *Linnaeus* (Grecian Periploca).—*Asclepiadaceæ* § *Periploceæ*—

A woody climbing plant, growing to a length of thirty or forty feet, with opposite broadly-lanceolate leaves, about three inches long; the flowers are produced in considerable bunches at the ends of the branches; they are about one inch across, cut in five segments, hairy, and of a deep dull purple colour, edged with green. A native of Asia Minor and the Grecian Archipelago. Introduced in 1597. Flowers in July and August. *Culture*.—Perfectly hardy; growing freely in common soil; propagated by layers in the open ground.

HABRANTHUS ANDERSONIANUS, *Herbert* (Anderson's Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant, with narrow, strap-shaped, sharp-pointed leaves, and a stem rising about six inches high, bearing one flower, which is divided into six segments, drooping, with the lowest segments shortest, varying in colour from that of gold to copper, and streaked more or less with reddish brown. Native of Buenos Ayres. Introduced in 1829. Flowers in May and June. *Culture*.—Nearly hardy; requires a loamy soil, good drainage, and perfect rest when not growing; propagated by offsets or by seed.

GENTIANA SAPONARIA, *Linnaeus* (soapwort leaved Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial, with stems above a foot high, and opposite, lance-shaped, strongly-nerved leaves; the flowers are produced in the axils of the leaves, being crowded towards the tops of the shoots; they are large, barrel-shaped, never expanding, more than an inch long, of a very deep blue colour. A native of North America, in open grassy places in woods. Introduced in 1776. Flowers in August and September. *Culture*.—Hardy; requires a mixture of loam and bog, and a shady situation; propagated by division of the root.

ALSTRÖMERIA PEREGRINA, *var. flore alba* (white-flowered foreign Alströmeria).—*Amaryllidaceæ* § *Alstromeriææ*.—A tuberous-rooted plant, with annual stems about two feet high, bearing scattered fleshy leaves, twisted in the middle, and furnished with a few large flowers at the top; the flowers are of six segments, somewhat trumpet-shaped, white, with green markings. A seedling variety, raised in England. *Culture*.—Nearly hardy; requires slight protection from frost; free light loam, and careful watering when in a dormant state; propagated by division of the root, and by seeds, which sport greatly.

ALSTRÖMERIA PULCHRA, *Sims* (fair Alströmeria).—*Amaryllidaceæ* § *Alstromeriææ*.—A tuberous-rooted plant, with annual stems rising two or three feet high, and bearing twisted light green leaves, and two or three

mouth, where they are also fringed; the colour is deep blue. A native of the Crimea, and of alpine situations thence to Persia. Introduced in 1804. Flowers in June and July. *Culture*.—Hardy; requires a mixture of loam and bog; propagated by division of the root.

SENECIO POPULIFOLIUS, *De Candolle* (popular leaved Senecio).—*Asteraceæ* § *Tubulifloræ*-*Senecioneæ*.—A half shrubby erect growing plant attaining three to four feet high, clothed with close white wool, and having alternate cordate-ovate, angulated leaves, covered on the under side with dense soft white wool. The flowers grow in large corymbose panicles at the end of the branches, and are large, daisy-like, and numerous; the disk is purplish, and the ray white tipped with delicate purple-lilac. A native of the Canary Islands. Introduced in 1780, and probably the parent of many of our half-shrubby cultivated *Cinerarias*. Flowers from June to September. It is also called *Cineraria populifolia* (L'Heritier). *Culture*.—Requires a greenhouse or frame in winter, grows out-doors in summer; light rich loam; propagated freely by cuttings in slight heat.

EPIDENDRUM UMBELLATUM, *Swartz* (umbel-flowered Epidendrum).—*Orchidaceæ* § *Epidendræ*-*Læliadæ*.—A small epiphytal plant, with numerous unbranched stems, alternate, distichous, leathery, oblong leaves, and umbels of small greenish coloured flowers terminating the stems; these flowers are of a waxy appearance, not very showy, and scented, but the scent is hardly agreeable. A native of Jamaica. Introduced in 1793. Flowers in June and July. Called also *E. difforme* (Jacquin), and probably the same as *E. corymbosum* (Ruiz and Pavon). *Culture*.—Requires a moist stove, and the usual treatment of orchids; propagated by division of the plant.

HABRANTHUS BAGNOLDIANUS, *Herbert* (Mr. Bagnold's Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A bulbous plant with large black bulbs, long strap-shaped glaucous leaves, and a green stem rising six or more inches high, crowned by about six large flowers, which are about two inches long, trumpet-shaped, divided into six segments, of a yellow colour, spotted inside with red. A native of Chili, near Coquimbo, in dry gravelly places. Introduced in 1829. Flowers in October and November. *Culture*.—Nearly hardy, but better kept in a well drained pot; sandy loam, plenty of water when growing, and perfect rest afterwards; propagated by offsets or seeds.

GENTIANA ASCLEPIADEA, *Linnaeus* (Asclepias-like Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial with stems rising nearly eighteen inches high, having

opposite pointed somewhat heart-shaped leaves, and a dense spike of large flowers at top; the flowers are bell-shaped, about two inches long, divided at the mouth into five segments, and of an intensely deep blue colour. A native of Europe in moist shady places. Introduced before 1629. Flowers in July and August. *Culture*.—Hardy; prefers a moist loamy soil in a sheltered spot; propagated by division of the roots, or by cuttings of the same parts.

HABRANTHUS HESPERIUS, *var. miniatus* (red-flowered western Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant with narrow strap-shaped leaves about a quarter of an inch wide, and a stem about eight inches high, bearing from two to five or more flowers at top; the flowers are about two inches long, of six acute segments, trumpet-shaped, and of a brick-red colour. A native of Chili, near Valparaiso. Introduced in 1832. Flowers in July. *Culture*.—Nearly hardy; requires a hot dry place, free loam, abundant moisture while growing, and complete rest afterwards; propagated by offsets or seeds.

GENTIANA MACROPHYLLA, *Pallas* (large-leaved Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial with a stem nearly a foot high, bearing a few long leaves at the summit; the root leaves are as long as the stem, and lance-shaped; the flowers are crowded into a dense head on the top of the stem, tubular, generally with four short spreading segments of an intense blue colour inside. Native of eastern Siberia, common in pastures. Introduced in 1796. Flowers in June and July. *Culture*.—Hardy; prefers a moist loam; propagated by seeds, or division of the root.

LOBELIA CAVANILLESII, *Roemer and Schultes* (Cavanilles' Lobelia).—*Lobeliaceæ* § *Lobeleææ*.—An erect-growing plant, with stems attaining four feet in height, narrow lance-shaped leaves three to four inches long, and flowers produced singly in the axils on stalks which curve downwards, and are as long as the leaves: the flowers are tubular, slit along the upper side, and two-lipped, the upper lip consisting of two acute segments, the lower one oblong and three-toothed; they are red on the upper side, but yellow below and within. A native of Mexico, near Acamzambo. Introduced in 1825. Flowers in July and August. Also called *Lobelia persicifolia* (Cavanilles) and *Siphocampylus Cavanillesii* (garden name). *Culture*.—Suitable for growing in pots for autumn and winter blooming in the greenhouse; rich loamy soil; propagated by cuttings in gentle heat.

GENISTA BRACTEOLATA, *Link* (racemose Genista).—*Fabaceæ* (*Leguminosæ*) § *Papilionaceæ*-*Genisteææ*.—A free-growing shrubby

plant, with spreading branches, covered, as well as the leaves, with short silky hairs; the leaves are trifoliolate, with obovate lance-shaped leaflets; and the flowers are borne in racemes from almost every lateral branch, yellow, butterfly-shaped, and very sweet scented. A native of the Canary Islands. Introduced in 1823. Flowers throughout the spring months, often in winter. Also known in gardens as *Cytisus racemosus* (garden name). *Culture*.—Requires a greenhouse; rich loamy soil, and plenty of pot-room; propagated by cuttings in gentle heat.

HABRANTHUS HESPERIUS, *var. pallidus* (pale-flowered western Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant, with glaucous, blunt, strap-shaped leaves, and a stem rising about six inches high, supporting from two to seven flowers on the top; the flowers are large, of six segments, trumpet-shaped, varying in colour from white to pale yellow, sometimes tinged with red. A native of Chili, near Valparaiso, in dry gravelly places. Introduced in 1821. Flowers in May and June. Also known as *Amaryllis advena var. cerina* (Lindley). *Culture*.—Nearly hardy; requires a hot dry place, free loam, plenty of water while growing, and complete rest afterwards; propagated by offsets or seeds.

GENTIANA ACAULIS, *Linnaeus* (stemless Gentian, or Gentianella).—*Gentianaceæ* § *Gentianææ*.—A dwarf evergreen herbaceous perennial, seldom more than four inches high, with broad somewhat heart-shaped leaves, of a deep green colour; the flower is solitary, bell-shaped, nearly three inches long, with the top spreading in five broad segments of an intense blue colour, the tube of a paler colour, with dark spots. A native of the mountains of Europe. Grown by Parkinson before 1629; wrongly said to be indigenous in Wales. Flowers in April and May. *Culture*.—Perfectly hardy; flourishing best in deep moist loam; propagated by parting its roots in autumn, or by seed.

HABRANTHUS VERSICOLOR, *Herbert* (changeable-flowered Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant, with strap-shaped leaves a foot long and a quarter of an inch wide, and a stem about six inches high, bearing a solitary flower about two inches long, trumpet-shaped, of six segments, white tinged with pink and tipped with red. A native of South America. Introduced in 1821. Flowers in September. *Culture*.—Nearly hardy; requires free loam, complete drainage, plenty of water whilst growing, and perfect rest afterwards; propagated by offsets or seeds.

PERIPLOCA GRÆCA, *Linnaeus* (Grecian Periploca).—*Asclepiadaceæ* § *Periploceæ*—

A woody climbing plant, growing to a length of thirty or forty feet, with opposite broadly-lanceolate leaves, about three inches long; the flowers are produced in considerable bunches at the ends of the branches; they are about one inch across, cut in five segments, hairy, and of a deep dull purple colour, edged with green. A native of Asia Minor and the Grecian Archipelago. Introduced in 1597. Flowers in July and August. *Culture*.—Perfectly hardy; growing freely in common soil; propagated by layers in the open ground.

HABRANTHUS ANDERSONIANUS, *Herbert* (Anderson's Habranth).—*Amaryllidaceæ* § *Amaryllææ*.—A small bulbous plant, with narrow, strap-shaped, sharp-pointed leaves, and a stem rising about six inches high, bearing one flower, which is divided into six segments, drooping, with the lowest segments shortest, varying in colour from that of gold to copper, and streaked more or less with reddish brown. Native of Buenos Ayres. Introduced in 1829. Flowers in May and June. *Culture*.—Nearly hardy; requires a loamy soil, good drainage, and perfect rest when not growing; propagated by offsets or by seed.

GENTIANA SAPONARIA, *Linnaeus* (soapwort leaved Gentian).—*Gentianaceæ* § *Gentianææ*.—A herbaceous perennial, with stems above a foot high, and opposite, lance-shaped, strongly-nerved leaves; the flowers are produced in the axils of the leaves, being crowded towards the tops of the shoots; they are large, barrel-shaped, never expanding, more than an inch long, of a very deep blue colour. A native of North America, in open grassy places in woods. Introduced in 1776. Flowers in August and September. *Culture*.—Hardy; requires a mixture of loam and bog, and a shady situation; propagated by division of the root.

ALSTRÖMERIA PEREGRINA, *var. flore alba* (white-flowered foreign Alströmeria).—*Amaryllidaceæ* § *Alströmeriææ*.—A tuberous-rooted plant, with annual stems about two feet high, bearing scattered fleshy leaves, twisted in the middle, and furnished with a few large flowers at the top; the flowers are of six segments, somewhat trumpet-shaped, white, with green markings. A seedling variety, raised in England. *Culture*.—Nearly hardy; requires slight protection from frost; free light loam, and careful watering when in a dormant state; propagated by division of the root, and by seeds, which sport greatly.

ALSTRÖMERIA PULCHRA, *Sims* (fair Alströmeria).—*Amaryllidaceæ* § *Alströmeriææ*.—A tuberous-rooted plant, with annual stems rising two or three feet high, and bearing twisted light green leaves, and two or three

flowers at the extremity; the flowers are large, white, with green and red tips, and blotches of purple and yellow. A native of shady places on gravelly hills in Chili. Introduced in 1822. Flowers from June to October. Known also as *Alströmeria tricolor* (Hooker), and *Alströmeria Flos Martini* (Ker). *Culture*.—Hardy in sheltered situations; free loam; propagated abundantly by its running roots, or division of its tubers.

HIBISCUS SPLENDENS, *Graham* (splendid Hibiscus).—Malvaceæ § Hibisceæ.—A large-growing shrubby plant, with ascending branches and very large palmate leaves with three or five lobes; the flowers are borne singly in the axils of the leaves, five or six inches in diameter, of five obovate delicate rose-pink petals, and freely produced. A native of New Holland. Introduced in 1828. Flowers in May. *Culture*.—Requires a warm greenhouse, sandy loam and peat; propagated by cuttings or seeds.

EPIDENDRUM NUTANS, *Swartz* (nodding-flowered Epidendrum).—Orchidaceæ § Epidendreæ - Læliadæ.—A moderately strong-growing epiphyte, with an upright stem, distichous obtuse oblong leaves, and drooping racemes of highly fragrant flowers from the ends of the stems; the flowers are of a pale watery green colour, tinged with yellow, the sepals oblong lance-shaped, the petals linear lance-shaped, and the lip three-lobed, with a tubular base. A native of Jamaica. Introduced in 1793. Flowers in June and July. *Culture*.—Requires a moist stove, turfy peat soil, and to be potted high; propagated by dividing the plant.

SIPHOCAMPYLUS REVOLUTUS, *Graham* (revolute Siphocampylus).—Lobeliaceæ § Lobelææ.—An erect sub-shrubby plant, not much branched, with alternate cordate ovate narrow pointed dentate leaves, and three or four flowers growing from the top part of the stem; the flowers are purplish red, tube-shaped, divided at the end into five narrow reflexed unequally spreading segments showing the inside of a yellowish white. A native of America, but the locality is not certainly known. Introduced in 1838. Flowers from November to February. *Culture*.—Requires a warm greenhouse; free loamy soil; propagated by cuttings in a gentle heat.

CORYANTHES MACULATA, *Hooker* (spotted Coryanthes).—Orchidaceæ § Vandææ-Maxillariidæ.—An epiphytal plant with elongated pseudo-bulbs, from the top of which spring the broadly lance-shaped leaves, and from their base proceeds the pendulous raceme, bearing two or three large and singularly grotesque looking flowers, whose form defies description; the sepals and petals are of delicate texture, ochrey yellow, irregularly spotted

with dull purple; the lip is fleshy, and forms two irregular cups connected by a plaited-like stalk; the colour is nearly that of the sepals, mixed with dark blood-colour. A native of Demerara. Introduced in 1829. Flowers in June and July. *Culture*.—Requires a hot damp stove; and to be planted in an open basket among turfy peat, and suspended; propagated by division of the plant.

ZEPHYRANTHES TUBISPATHA, *Herbert* (tube-spathed Zephyranth).—Amaryllidaceæ § Amaryllææ.—A small bulbous plant with narrow strap-shaped leaves, and a stem six inches high, supporting a solitary flower, which is funnel-shaped, spreading, of six segments, white, somewhat green at the base. A native of Jamaica on the Blue Mountains. Time of introduction not known. Flowers in May and June. *Culture*.—Requires a stove; sandy loam, plenty of water in summer and absolute rest in winter; propagated by offsets or seeds.

GENTIANA SEMTEPFIDA, *var. punctata* (spotted seven-cleft Gentian).—Gentianaceæ § Gentianææ.—A herbaceous perennial with stems rising about one foot high, thickly clothed with opposite lance-shaped leaves, and terminated by three or more flowers; which are tubular, about two inches long, with five segments, spreading at the mouth and fringed; the tube is white spotted, the segments intense blue, spotted with white. A native of the Crimea and Caucasus. Introduced in 1804. Flowers in June and July. *Culture*.—Hardy; requires a mixture of loam and bog; propagated by division of the root.

HABRANTHUS ROBUSTUS, *Sweet* (stout-growing Habranth).—Amaryllidaceæ § Amaryllææ.—A bulbous plant, with narrow strap-shaped channelled leaves, and a stout stem, a foot or more high, terminated by a single drooping flower, which is trumpet-shaped, of six segments, three and a half inches long, a purplish pink colour fading to white. A native of Buenos Ayres. Introduced in 1827. Flowers in July and August. This is believed to be the *Amaryllis tubispatha* (L'Heritier) and *Amaryllis Berteri* (Sprengel). *Culture*.—Nearly hardy; requires a hot dry situation, free loam, plenty of water while growing, and entire rest afterwards; propagated by seeds or offsets.

PLUMIERIA RUBRA, *Linnaeus* (red-flowered Plumieria).—Apocynaceæ § Plumierææ.—A shrub or small tree with milky sap, thick round branches, naked except near the ends where the large broadly lanceolate leaves are produced; the leaves are smooth, shining, of a bright green colour and beautifully veined; the flowers are also produced at the ends of the branches in large bunches; they are very

fragrant, tubular with five blunt segments, of a rich rosy colour. A native of the West Indies. Introduced in 1690. Flowers in July. *Culture*.—Requires a stove, free rich loam, perfect drainage, and very little water in the winter; propagated by cuttings in strong heat, and kept nearly dry.

HIBISCUS TELFAIRIÆ, *Henslow* (Mrs. Telfair's Hibiscus).—*Malvaceæ* § *Hibisceæ*.—A showy erect-growing shrubby plant, growing from three to eight feet high, with a branching stem, alternate ovate crenated leaves, and large rose-coloured blossoms from their axils, growing singly: at the base of the leaf stalks are situated a pair of awl-shaped stipules. The flowers, though large, are less so than those of many other species; they are mallow-like, rose-coloured, deepest in the centre, with a projecting stamiferous column. A native of the Mauritius, where it exists in numerous varieties. Introduced in 1825. Flowers in June and July. *Culture*.—Requires a warm greenhouse; loam and peat; propagated by seeds, or cuttings in gentle heat.

STYLIDIUM DRUMMONDII, *Graham* (Mr. Drummond's Stylidium).—*Stylidiaceæ*.—A herbaceous perennial, forming a tuft of long linear lance-shaped rigid leaves, from among which arises the flower scape a foot or more high, erect, and bearing at the top a panicle of flowers; the latter are about an inch across, of a rosy-lilac colour, consisting of four obovate segments diverging like a cross, and a smaller lobe not conspicuous. The column of the

Stylidium is singularly irritable. A native of New South Wales. Introduced in 1838. Flowers from November to March, the flower remaining a long time perfect. *Culture*.—Requires a greenhouse; sandy peat with a little loam; propagated by seeds, or slowly by dividing the plant.

ALSTRÖMERIA PULCHRA, *var. bicolor* (two-coloured fair *Alströmeria*).—*Amaryllidaceæ* § *Alströmeriæ*.—A tuberous-rooted plant, with annual stems about two feet high, bearing twisted light-green leaves, and a few flowers at the top, which are large, broadly trumpet-shaped, variously marked with white, yellow, and green. A seedling variety of *Alströmeria pulchra* (Sims). Flowers from June to October. *Culture*.—Nearly hardy, requiring slight protection; sandy loam and leaf mould; propagated by division of the root, or by seeds, which sport much.

ALSTRÖMERIA NEILLIANA, *Herbert* (Dr. Neill's *Alströmeria*).—*Amaryllidaceæ* § *Alströmeriæ*.—A tuberous-rooted plant with annual stems, bearing flat spatulate leaves, and producing flowers at the top; the flowers are composed of six segments, of a blush pink colour marked with a deeper shade, the upper petals blotched with yellow. A native of Chili near Mendoza. Introduced in 1827. Flowers in June and July. *Culture*.—Requires a greenhouse, and considerable attention, being a very shy plant; sandy loam and leaf-mould; propagated by division of the root, or by seeds.

AGRICULTURAL AND HORTICULTURAL CHEMISTRY.

THE popular theories advanced by popular writers on the component parts of animal and vegetable productions, tell us that a peach or an apple is composed of such and such quantities of such and such things; and they profess to account for the growth, swelling, ripening, and the changes of one thing into another, as if these things were purely a matter of mechanical construction, dependent on nothing more than the handywork of knocking pieces of wood together to make a fence, or any other simple process which exemplifies in its progress cause and effect. They will pretend there is no more mystery in a peach or a strawberry, than there is in a cricket ball or a dog kennel. They give you the exact composition of which it is made, item by item, quantity by quantity, but they forget all about the flavour. It is here that the Almighty Giver of all good things checks the analyzer, and proclaims the presence of something the chemist cannot fathom. There may be the same ingredients in the constitution of many different vegetable productions, but what is the crowning ingredient that

gives the exquisite flavour to the numerous luxuries that vie with each other, yet vary from each other in the delicious fragrance and flavour? To a certain extent we are permitted to dive into the mysterious work of the Creator—deep enough to answer all the purposes of utility; but there is a boundary beyond which science must not pass, or rather cannot pass. The chemist may make and unmake a salt, he may mix and separate a hundred combinations, leaving things as he finds them; but when he touches animal or vegetable composition, he can only undo. He may tell us that the potato withdraws from the soil potash, soda, lime, magnesia, silica, alumina, oxide of iron, sulphuric acid, phosphoric acid, and chlorine; he jumps however at this conclusion, because he can find all these things in a potato; he knows no more about where it comes from than the man in the moon. How much of it comes in rain, or is absorbed in a state of gas, is to him, with all his knowledge, a mystery, a sealed book. In mineral affairs he feels at home: he may resolve saltpetre into fourteen parts

of nitrogen, forty parts of oxygen, and forty-eight parts of potash, and make it into saltpetre again ; but there is no resolving a potato into all its separate elements and making it up again—no, not even the composition, for there will be no similarity between the best composition he can make up and the original article. There may be all he pretends in the original, but there is more.

It is so in all animal and vegetable productions. Let the vital principle go for nothing; let the chemist take a dead and dried fruit, nay, let him take ten-years-old preserves if he likes, analyze and separate all the parts, he will pretend to lose nothing but water ; but let him put all the parts together again, and as much water as he has lost, and he will make a sorry substitute for the fragrance and flavour of the raspberry he has spoiled.

There is a good deal of science, and much of the work of scientific men, that looks well on paper ; but the chemist's conclusions will not bear analyzing. Chemistry is only perfect, so long as the chemist can do what he has undone, and undo what he has done, for all else is uncertainty and guess work ; hence it is that no two of them agree in the analysis of one vegetable or animal subject ; but that this difference may be less remarkable as to the quantities, they will not resolve them into the same elements ; and assuredly nothing was ever more erroneous than the supposition, or rather the conclusion, that because they find certain things in the composition of a turnip or a mangold-wurtzel, these vegetables have drawn them from the earth. We rather wish these learned men would grow some of these things in wet sand, in wet flannel, or in some medium of which the composition is perfectly known ; and when they have analyzed them, tell us the difference in the composition from others properly grown in the soil they recommend. They should have nothing but rain water. We should like for instance to know, whether all these different substances of which the plant are said to be composed, are not to be found in the seed itself in small proportions, and whether they do not increase as naturally as the bulk of the thing itself ; and whether,—for this is the main point,—whether they do not absorb a vast amount from the air and rain water, as well as from the earth ? How, therefore, can they presume to say what a crop will withdraw from the soil ?

The greatest utility has arisen from the analysis of the various manures which are known to be efficacious, but even a good deal of this is fallacious. How, for instance, can anybody pretend that an analysis, such as they give out, can be even bordering upon correct ?

Let us copy a table that has been pretty much circulated, by Mr. Nowell of Farnley Wood :—

"Farm-yard dung yields per ton," he says :—"Potash, 2lb. 4oz. ; soda, 1lb. 10oz. ; phosphoric acid, 5lb. 1oz. ; sulphuric acid, 1lb. 4oz. ; chlorine, 1lb. 9oz. ; total, 11lb. 12oz." We should like to know what has become of the rest ; where goes the 19cwt. 3qrs. 16lbs. and upwards ? can this be called a satisfactory analysis ? We may be told that the foregoing substances are the most important fertilizers, but in other places we are told that *nitrogen* is "the grain-perfecting agent," and that "farm-yard manure contains 11lb. in the ton." Let us take another subject.

*"Night soil yields per ton :—*Potash, 6lb. 7oz. ; soda, 4lb. 10oz. ; phosphoric acid, 120lb." No sulphuric acid, no chlorine. Now here there is a deficiency of nearly 19cwt. out of the ton. Where is it ? What is it ? Another analysis tells us it contains 39lb. 8oz. *nitrogen*.

*"Urine yields per ton :—*Potash, 4lb. 6oz. ; soda, 8lb. 7oz. ; phosphoric acid, 3lb. 4oz. ; sulphuric acid, 5lb. 6oz. ; chlorine, 6lb. 1oz." Here we may form a notion that the other 19cwt. 3qrs. is pure water, but that notion may be very erroneous ; and if it be not, what is it ? Another analysis tells us that 100 gallons contains 15lb. 8oz. *nitrogen*.

*"Raw bones yield per ton :—*580lb. of phosphoric acid." Nothing else is mentioned. We are told elsewhere, that they yield 120lb. *nitrogen*. All of which is very puzzling to the uninitiated. The last we shall touch upon is *guano*.

*"Guano yields per ton :—*Potash, 66lb. 8oz. ; soda, 36lb. 15oz. ; phosphoric acid, 283lb. 9oz. ; sulphuric acid, 93lb. 8oz. ; chlorine, 62lb." Here is pretty nearly half a ton unaccounted for ; not a word about *nitrogen*, of which, however, we are told in another place, a ton yields 182lb. 8oz. If we were to search for other analyses of the same things, we should not find potash, soda, phosphoric acid, sulphuric acid, and chlorine, mentioned, but another series of constituent parts altogether, as if it were a foreign body.

Before, however, we proceed to quote any other, we should observe that these have been taken from Mr. Nowell's excellent little work, "The Manual of Field Gardening." He does not say where he gets the analyses, but we have no doubt from good authority. We are now going to quote another analysis of night soil and guano, to show that chemists do not even resolve things into the same elements. We have already seen that, according to our author, night soil is composed of potash, soda, and phosphoric acid ; nothing else is even named. Now we take an analysis

from the Muck Manual, an excellent work by "the Author of British Husbandry;" we are there told that 100 parts of night soil consists of—water, 75 parts, 3 tenths; geine, 23 parts, 5 tenths; salts, 1 part, 2 tenths. Who can pretend to judge by analyses so contrary in terms as well as quantities? Let us, as a closing proof that we are not running a-muck at chemists for nothing, give two more analyses of guano. We have already given one, in which it is resolved into potash, soda, phosphoric acid, sulphuric acid, and chlorine. Now let us give Dr. Ure's:—

	Parts.
Azotized organic matter, including Urate of Ammonia, and capable of affording 8 to 17 per cent. of Ammonia, by a slow decomposition in the soil (very explicit this)	50
Phosphate of Lime	25
Ammonia, Phosphate of Magnesia, Phosphate of Ammonia, and Oxalate of Ammonia, containing from 4 to 9 per cent. of Ammonia (very explicit again)	13
Silicious matter from the crops of birds	1
Water	11
	100

Would any reasonable man believe that this is the same thing that we have been reading about—guano, which we have shown, by another analysis, contained potash, soda, phosphoric acid, sulphuric acid, and chlorine? No! Now let us take another great man's analysis of the same subject. We have too low an estimate of analyses in general, to expect the same quantities; but surely they might act upon some constant plan, and give us the same elements; but no, here we have Voelckel's analysis of guano:

	Parts.	Tenths.
Urate of Ammonia	9	0
Oxalate of Ammonia	10	6
Oxalate of Lime	7	0
Phosphate of Ammonia	6	0
Phosphate of Magnesia and Ammonia	2	6
Sulphate of Potash	5	5
Sulphate of Soda	3	8
Muriate of Ammonia	4	2
Phosphate of Lime	14	3
Clay and Sand	4	7
Animal Substances, with a small quantity of Salts of Iron and Water	32	3
	100	0

We hope we have not gone further than is perfectly allowable in the condemnation of the present unsatisfactory conclusions drawn

from such vague analysis; that we have not taken too great a liberty with our scientific friends, in reminding them that they are very apt to overstep their boundaries, to affect a knowledge which they do not possess, and draw conclusions which are not warranted. The greater features of agricultural chemistry are well enough; it is only when unnecessary details are attempted that the limited knowledge of even chemists is made apparent, and that the cord which sustains or should sustain the reputation of science, is stretched too much and snaps. We have not patience enough to undertake the work ourselves, but we should like to see collected all the different analyses of guano, night soil, urine, the different animals' dung, &c. We know very well that under different circumstances there must be different results; but we complain of their being all given upon different plans. This cannot be right, if intended to be useful alike. Some appear to test the presence of one series of substances; others either do not go so far, or go farther, or do not go the same road at all. Some labour to prove one thing the leading agent; another argues as strongly to prove that something else is the all-powerful producer. One will write of nothing but carbon, as if the vegetable world depended on that alone; another will neither talk, write, nor hear of any thing but nitrogen. A third ascribes every thing to ammonia, while there are not wanting, as we see daily in the newspapers and pamphlets devoted to horticulture and agriculture, persons who affect to give us the exact proportions in which a dozen things make up a carrot, turnip, or cabbage, or grain, or lentils, as if they were so many different articles of confectionary. Still, there can be no doubt that farm-yard dung gives heart and strength to the soil in a large degree; and when ten or fifteen ton to the acre is applied, there is a body of some sort laid on the land, which must add every year to the fertilizing quality, and leave it in a much better state than those manures can which are used in so much smaller quantities. Nevertheless, chemical manures, of which a little weight goes a great way, must be admirably adapted to lands in mountainous districts, where a heavy crop of turnips or other crops can be grown to be fed off on the ground by sheep, and thus become enriched by all produce being returned to the soil, except that which goes away in flesh and bone. We have done for the present. In the eyes of the chemists themselves, we may betray a great want of knowledge; but to us it is obvious they betray as great a lack of consistency.



GRISLEA TOMENTOSA.

GRISLEA TOMENTOSA, *Roxburgh* (downy-leaved *Grislea*).—Lythraceæ § Lythreæ.

Many years since, the editor of the *Botanical Register*, writing of this plant, observed respecting it, that, in point of ornament, it seemed in some sort to fill in the hothouse the same place which the *Fuchsia coccinea* did in the other departments of the garden. To this encomium its numerous tubular bright red flowers seem to entitle it. It is very seldom, indeed, now seen in collections, having been introduced at a time when the culture of plants, as objects of high art and skill, was not much attended to; consequently it did not retain its position in collections where, as was very common, old subjects were discarded for mere novelties, having no pretensions to the beauty of many of the species which gave place to them. This is, indeed, now in some measure the case, though perhaps to a less extent than at a past but not remote period. We have introduced a sketch and notice of this species of *Grislea* with the view of thus allowing it to recommend itself to the notice of the plant growers of the present day.

Grislea tomentosa is a shrubby plant, of erect branching habit, the branches being somewhat villous, and furnished with opposite leaves arranged in two ranks; the shape of the leaves is cordate-lanceolate, and they are of a dull green colour, and downy beneath, nearly sessile. The flowers grow in

contiguous cymes in the axils of the upper leaves, and are very showy, being numerous as well as moderate sized, and of a vermillion scarlet colour; the calyx is permanent, tubular, club-shaped, about an inch-and-a-half long, a little curved, and divided at the end into small pointed teeth, alternating with which, and attached to the interior of the calyx-tube near its mouth, are an equal number of small narrow petals. Projecting considerably beyond the tube is a tuft of ascending stamens, of the same red colour. In regard to the number of the stamens, of the segments of the calyx, and of the petals, the plant is subject to considerable variation; sometimes the two latter are as few as six, sometimes as numerous as twenty, or perhaps more, and the number of the former varies from eight to twenty—a puzzle for the student of the Linnæan system of classification.

It is a native of "the hills and valleys of the northern provinces of the Carnatic," and of the Island of Java, and was introduced to this country so long since as 1804. In its native country it flowers during the cold and at the beginning of the hot season; in our hothouses the blossoms are produced in April and May. It is stated that in India the beauty of the plant is considerably prolonged in consequence of the permanence of the calyces, which are retained for the protection or nourishment of the seed-vessels.

The other names borne by this species are the following :—*Woodfordia floribunda* (Salisbury); *Lythrum fruticosum* (Linnaeus).

The flowers of this *Grislea tomentosa* are employed in India, mixed with *Morinda*, for dyeing, under the name of *Dhaee*. According to Dr. Roxburgh, the appellation borne by the plant in the Telinga dialect is *Seringie*.

The temperature of the stove is required for its successful cultivation. Cuttings may be taken off in the spring, and planted in pots of sand, under bell-glasses, when, if placed where there is a gentle bottom heat, they will soon take root. When this is the case, they should be potted singly into well-drained pots of small size, in a compost of light loam and peat-earth, made rather more porous than ordinary by the admixture of silver-sand; this is to promote the growth of the roots without exciting too great a development of the tops. They may be grown on in a hot frame, or near the glass in the hothouse, being kept moderately supplied with water. As the roots increase, the plants require to be shifted

into larger pots. The compost at each successive shifting may be less and less sandy, so that after two or three shifts a very small portion of sand, perhaps an eighth of the whole, may be used. During the whole of this season the tops of the plants should be pinched back from time to time, so as to produce a thick bushy stocky habit; and the growth should be well ripened at the end of summer, by exposing the plants to a good heat by day, with plenty of air, and withholding a proportion of water, so as to keep them rather drier at the roots. In the depth of winter the plants must be kept nearly dormant in a cooler temperature, such as should at that season be accorded generally to stove plants not under forcing treatment; and thus they may remain till the month of February, in which they may be brought again into action, by the gradual excitement of their vegetating powers, the development of young and healthy shoots being followed by the production of blossoms from the axils of the leaves near their extremities.

CONTINENTAL GARDENS.

THE following is a translation of a portion of some notes on the Horticulture of Europe, by M. H. Lecoq, Professor of Natural History, Clermont-Ferrant, Belgium :—

BOTANIC GARDEN OF VENICE.

After traversing the smiling landscapes of Switzerland, and the beautiful plains of Lombardy, I arrived at Venice as the Statice and the Aster covered all the strips of ground intersected by the canals, with their pretty flowers. The town itself is situated, as is known, in the midst of waters. It is quite astonishing to see such a grand display of flowers and fruit as is here presented. The shops of the flower-dealers are numerous, and always well supplied with flowers; consisting of inferior zinnias, single or semi-double dahlias, pinks, nearly wild, some vervains, and a few tagetes and China-asters. With these miserable flowers, arranged among some leaves of rose-scented pelargoniums, small bouquets are made, which pretty flower-girls offer you in the arcade of La Place St. Mark.

On Sundays and fête-days each dealer makes his exhibition before his door. From forty to fifty decanters contain flowers similar to those just mentioned. In the midst of all is generally placed a crown, a large bouquet, or some other object exquisitely composed. It is hardly to be conceived that with so poor resources so fine an effect could be produced.

If the flowers present nothing remarkable, this cannot be said of the fruit. During the whole of September the warehouses of the

fruiterers were completely decorated. There were to be seen numerous gondolas entering Venice from all parts of the adjacent coast, and even from the other side of the Adriatic, laden with baskets, in which the various kinds of fruit were arranged like the flowers in a bouquet: here, the rosy and velvety peaches raised in regular pyramid; there, grapes of different colours grouped in crowns above each other; then azaroles of a brilliant red; pears and apples of various kinds, tomatoes and pomegranates. These gondolas move slowly and steadily along, and arrive at their destination without anything being displaced by shaking. The baskets are now placed in several ranges, in which the tomatoes and the azaroles are intermixed to increase the effect, in contrast with the other fruits. The front is set off with several varieties of figs, and the perspective is formed with melons. The floor of this sailing shop is generally furnished with evergreens forming a kind of screen, open at a certain point in order to reveal the fair Madone, who is busy attracting her customers towards so fine a display. It is thus that Venice receives every morning the tribute of the banks of the Adriatic, and horticulture is in these quarters a very considerable source of traffic. Innumerable barges also arrive, laden with melons and sweet gourds, which the people use very extensively. The sale of these fruits occupies a great number of individuals. Everywhere water-melons, designated in the country by the name of *Cocomeres*, are hung out for sale; they are large, of a fine green,

and with the flesh of a delicate rose-colour, and the seeds brown. The veritable dealer in cocumeres takes his stand in some public place, or on the Quai des Esclavons; he cuts one of his fruit in slices, at from one to two centimes—the fifth part of a farthing. He understands how to attract his customers by the very art with which he cuts a melon. With grimaces, gestures, and smacking his fingers, he dilates at considerable latitude on the taste, the colour, the smell, and the tenderness of the fruit he has just opened, which is always superior to any that he has yet opened, and those remaining in his possession; but as soon as that one has found a customer, he finds, on taking up another, that he had formed too high an estimate of the preceding one; what he has now in his hand is still better—it is extraordinary, and delicious beyond comparison. Our merchant, who has thus been cutting slices of melons perhaps for twenty years, continues to find, or, with the innumerable superlatives of which the Italian language is susceptible, affects to find, that the fruit he has just opened is superior to all those which have passed through his hands.

There are two sorts of gourds also sold in the streets—one long called *Succo-zanta*, and the other flat, known under the name of *Barruck*. These obtain considerable sale; they are sold in slices roasted in an oven, are very palatable, and as low as from one to five centimes. The people make a prodigious consumption of these fruits; and although the confectioners of Auvergne assure us that the flesh of gourds and pumpkins cannot be made into paste, (an experiment which they have probably never tried!) those of Venice unaffectedly pass off the paste of gourds, without pretending to have apricots mixed with it.

In one of the islands of Venice, near the railway station, there is a Botanic Garden, under the able superintendence of Mr. Joseph Ruchinger. This garden was formed by a decree of the 23d April, 1810, and has arrived slowly but steadily to the prosperous condition in which it appears at the present day. The number of plants cultivated in it amounts to five thousand. The garden is in the form of a parallelogram, and very extensive. It is bounded by two large ditches of saltish water connected with the canals, and on digging to the depth of three feet, a briny kind of water is found; and if this soil, otherwise rich in mineral substances, suits some plants, there are others, and of this number those with large roots, to which it is essentially hurtful. Moreover, there are some kinds that cannot be cultivated at Venice, even in pots, owing to the proximity of the canals, and the air surrounding this locality being charged with saline particles.

There are many plants in this garden which deserve notice, whether for their rarity, fine growth, easy culture, or the readiness with which they flower and fruit. Of this number is the handsome *Yucca aloifolia*, thirty years old, and planted out during twenty-eight years. It grows by a south-west wall, without other shelter, and is about twenty feet high, divided into ten branches, which every year send out numerous panicles of flowers, that always ripen their fruit. Near the entrance to the garden is a pretty clump of *Thuja occidentalis* (*Arborvitæ*), about four feet high, rising in twelve regular pyramids; near this is another entirely formed of *Laurus nobilis* (bay), about six feet high, then another of *Taxus baccata* (yew), about four feet high. There are many trees remarkable for their vigorous vegetation, as *Plantanus orientalis*, sixty feet high; *Broussonetia papyrifera*, upwards of forty feet; *Gleditschia triacanthos*, sixty feet; *Ailanthus glandulosus*, forty-five feet; and a superb tree of *Melia Azedarach*, thirty feet high.

Leaving these fine specimens, the visitor is led towards the conservatory, in front of which a large number of Cacti are growing, some in pots, and others in the ground. Many of these plants deserve particular mention; and, perhaps, in their native countries they could not be grown finer than they are here. I observed, in particular, a *Cereus nycticalus*, thirteen feet high, though only seven years old; *C. setaceus*, ten feet, and five years old; a plant of *C. serpentinus* had attained sixteen feet in eight years; *C. ramosus*, nine feet in six years; and a *C. triangularis*, thirteen feet in eleven years. Those who are in the habit of growing succulents, know that the *Cereuses* grow very fast; but it is very seldom they reach such dimensions, in so little time. In the present instance, the vigorous growth may be traced to the mode of culture employed by M. Ruchinger. He treats these plants as everybody does the dahlias; that is, with well-manured soil and plenty of water. These essentials, with the humid and maritime atmosphere of Venice, sufficiently explain this luxuriant vegetation.

The *Opuntias*, which are treated in the same manner, are still more curious than the *Cereuses*. I do not think there is to be found in Europe a larger specimen of *O. brasiliensis* than that growing in a box before the large conservatory in this garden. It is thirty-two years old, with its trunk quite thorny, upwards of twenty feet high, and more than eighteen inches in circumference. It is slightly conic, and terminated by a rounded head. It resembles a large tree without leaves, and flat branches, which are yearly covered with fruit. Near this were large

clumps of other sorts of opuntias. Of those most distinguished, were *O. crassa*, about five feet high; *O. cylindrica*, upwards of ten feet; *O. dejecta*, nearly five feet; *O. picolominea*, six feet; *O. spinosissima*, ten feet; and *O. undulata*, upwards of four feet high. The fine thorns with which the most of these plants are furnished, and the large and numerous flowers which succeed each other on their articulated disks, render them objects of the most lively interest both to botanists and gardeners. In this garden, also, are two plants of *Ginko biloba* [*Salisburia adiantifolia*, the Maiden-hair tree], male and female, upwards of forty feet in height; and two of *Juniperus virginiana*, growing in the form of rounded pyramids, and reaching the height of twenty feet. Some of the clumps contain numerous arborescent subjects, both deciduous and evergreen. Others, of a circular form, are arranged according to the Linnæan system, and serve as a sort of botanic school; while another department is set apart for plants possessing medicinal properties. Those, also, employed in the arts and sciences, as well as those of a poisonous nature, are allotted separate places. Not far from these plats is another, in which is growing a white poplar (*Populus alba*), hardly thirty-two years old, and already upwards of seventy feet high; the bottom of the ditches constantly percolating water, into which the roots no doubt penetrate, may explain, to a certain extent, this activity of development.

A little farther on is a subterranean passage, constructed with materials obtained at the demolition of the convent of which the garden has usurped the place. From this the visitor proceeds over an aqueduct, which introduces from the canals the water necessary for the culture of marine plants. Close to this is a mound constructed with old ruins, tastefully planted, and commanding a magnificent view. From hence may be seen a great number of the canals, the railway station, and, in the distance, the Euganean mountains, at the back of the new bridge which connects Venice with the mainland. Not far from this point of view, may be seen some remarkable plants. Among these are *Cupressus horizontalis*, about six feet high; and a vast row of *Laurus nobilis*, thirteen feet high. Towards the south, in the open ground, is a large *Agave americana*, which even for this and the next year, shows its gigantic panicles.

There are no wild plants at Venice; and in order to meet with these growing spontaneously, one must visit the banks of the canals touching the mainland, or the banks of the Adriatic. There, are found plants somewhat rare, growing with others of greater frequency. There are *Eryngium amethyst-*

inum, *Cakile maritima*, *Scorzonera hispanica*, *Crithmum maritimum*, *Plantago cornuti*, and several kinds of *Salsola* and *Salicornia*. There, in the midst of this maritime vegetation, *Verbena officinalis*, *Cichorium Intybus*, *Medicago falcata*, and *Xanthium macrocarpum*, grow everywhere on the banks. I have found *Poa Eragrostis* and *Tragus racemosus* growing on the sands—grasses which also grow beside our mineral springs.

BOTANIC GARDEN OF PADUA.

This ancient town has preserved much of its magnificence. There are beautiful and handsome churches, prize pictures, and rich mausoleums. Even the language of St. Anthony is fondly cherished. In Padua are many large squares and promenades, and the statues are really enormous.

The Botanic Garden, the oldest in Italy, was the scene of a portion of the *fêtes* which are held during the sitting of Congress. Groups of musicians were distributed on the lawn, under the shade of large old exotic trees. A red and white tent was erected before the conservatories, and afforded protection to a horticultural exhibition, at which every amateur had been invited to compete. After having seen the exhibitions of Ghent, Paris, and Clermont: after having seen the horticulturists contend, with trouble and perseverance, against the rigours of climate, I expected to find, at this city of flowers, under a pure sky, an ethereal garden, such as Mahomet promised to his followers, or an Eden such as had been given to our first parents. Perhaps these preconceived ideas had, in spite of me, some influence on my imagination; but I must say, that what struck me most in this exhibition, was the gaudiness of the sentinels which were stationed on every hand.

But apart from this all was arranged with much taste. In the midst of the tent was a column with the bust of Cæsalpin, and all around were grouped the flowers and fruit, of which the latter was the most select, and consisted of many varieties, belonging in particular to the fine family of *Hesperides* (oranges). Of such were the *Citrus pictorum*, very large, and covered with orange warts; a dish of *Citrus del Brocco*, of *Citrus florentina*, of a fine green; of *Citrus* "scadek," having the form of a handsome coliquintida gourd, a little depressed at the crown; of *Citrus verrucosa*, covered with warts, all from Mr. Scipion Maupoil, who also furnished fine grapes of "*Uva odorata*." M. de Salvi, of Venice, sent a curious lot of ripe fruit of *Magnolia*, consisting of *M. triumphans*, *Soulangeana*, *discolor*, *amabilis*, *cordata*, *speciosa*, *Yulan*, *glauca*, *striata*, *grandiflora*, *macrophylla*, and *Norbertiana*;

also fruit of *Maclura aurantiaca*, camellias, artificially impregnated, and *Asimina triloba*. Besides these, there was a fruit-bearing Banana ; a Vanilla, with its siliquas nearly ripe ; numerous Pine-apples, and outside the tent a collection of oranges in pots, all bearing fruit. But amidst all these riches, the attention of the visitor was especially directed to a dwarf pear-tree. It was growing in a pot, and did not measure more than a foot and a half in height. It appeared to be *Pyrus regalis*, and had but one fruit, which, at the least, must have weighed two pounds. This prodigy belonged to the Abbé Berleze. If anything was wanted to complete the fine picture of the pomological riches of Lombardy, it was only necessary to go to the public streets and the markets ; there the numerous varieties of figs, peaches, grapes, pomegranates, apples, and pears, gourds, and melons, formed, themselves, a grand exhibition. I much regretted to see the art of the *Bouquetier*, which is carried on in Lombardy, as in Florence, to so high a degree of perfection, represented by a single subject, consisting of a vase of flowers, composed by Signor Dominico Beda. To make a bouquet sometimes requires great pains, for in Italy, at all the fêtes, those ornamental delicacies furnished by the confectioner are generally replaced by elegant bouquets of natural flowers. The bouquet is sometimes a vase, a crown, an obelisk, or something else in this way, serving as the ornament of the banquet, and fixing the attention of the company.

I shall try to give an idea of a bouquet by describing that of Signor Beda. The flowers of it formed two ranges or tiers composed of crowns artistically variegated. Verbenas of different colours, commencing with bright red and finishing with the most delicate rose, formed concentric circles, which surrounded beautiful corymbs of yellow Lantanas in the centre and roses outside ; then, white umbels of *Clypeola maritima*, a plant found at the sea-shore, and which is used in forming the base of the Italian bouquets. A garland of the green leaves of rose-scented Geraniums bordered this first part of the structure, like the rim of the vase of a little fountain, and

from which were suspended by the long peduncles the buds and half-opened flowers of Fuchsias. The second, or under part of the structure, wider than the other, presented a beautiful blue and white mosaic work, composed of Delphiniums and *Clypeola maritima*. This fine assemblage was surrounded by a large crown of *Heliotropes*, and connected with zones of rose and violet-coloured Balsams, alternating with *Stevia* and *Motherwort*. At last a girdle of red *Gomphrenas*, a diadem of *Nasturtiums*, an aureole set off with *Mimosa*, and the hanging flowers of *Abutilon striatum*, completed the whole structure, from which our florists might have derived inspiration. Already beautiful performances have been produced in this way since the introduction of large bouquets. Bouquets are now a considerable article of commerce throughout Europe,—a tax which is paid without constraint, and the receipt of which is a smile.

The botanic garden of Padua is one of the oldest in Europe, and in which there are exotic trees of the largest size, bearing their fruit as in their native countries. On oriental Plane dates from 1545, and this monument of three centuries is in all the vigour of age ; its only infirmity consists in a great number of knots, which render it very curious without destroying its robust health. The *Magnolia grandiflora* is as strong as the oak of our forests, and is covered with fruit every year. There is also a very old tree of *Ginkgo biloba*, and the high pyramids of Cypresses bespeak the remote period when they were planted. *Quercus Ilex*, and *Ægilops*, have also attained to a large size. The *Agnus-castus* (*Vitex Agnus-castus*), which is but a simple shrub in our lawns, has here attained to the stature of a large tree ; it appears to date from that good old time when the rustics believed in its virtues, or when the ancient monks, provided with a branch of the tutelar shrub, set the enraged demons at defiance in respect to the repose of their souls. But the tree, in getting old, has no doubt lost its powers ; or if there still issues from it an atmosphere of purity, it extends but little beyond its own shade.

THE MANAGEMENT OF VILLA GARDENS,

WITH MIXED PLANTS AND POT CULTURE.

THOSE who lay themselves out for a continual supply of flowers in a limited garden, must have recourse to the numerous ways of providing one thing under another to supply the places of declining plants, and so keep at all times ready the furniture which is to be displayed from time to time in the garden drawing-room as it were, the place always in sight. This may be done in two ways ; by

keeping store-beds, from which things are to be taken up in perfection very carefully, and replaced where they are to expand their beauties ; or it may be managed yet better by pot culture. In the one case you must remove things under a disadvantage, and sacrifice the health and strength of half-perfected roots and bulbs, or wait while they complete their growth, in which case the garden must be

occupied by things out of bloom, and therefore untidy, or without flower; in the other, no sooner is a thing past perfection than it is replaced. Pot culture restricts us, in some measure, to the size of a plant, because, if we constantly shifted them as soon as they required it, so as to spread to a noble size, the pots would be of a most unmanageable size. It is therefore necessary to restrain all the plants to a moderate growth. The stock of plants for the garden may consist of all the best of the perennials, and a few of the best of the biennials and annuals. The bulbs for spring blooming are necessarily a considerable time decaying, and if they are potted and plunged into the soil, they can be removed and replaced the instant the bloom decays. There are, however, some plants that are useless as soon as they have done blooming, and may be pulled up and thrown away directly. The principal plants for furnishing a constant succession of flowers may be thus classed:—

Mignonette; insignificant flower, but very odorous; six to twelve inches.

French Marigold; brown, purple, and gold, various shades; one foot to a foot and a half.

Dwarf larkspurs; blue, white, and pink, of several shades; nine inches to a foot.

Collinsia bicolor; pretty spike of blue, white, and yellowish flowers; nine inches to a foot.

Convolvulus minor; brilliant blue-purple; straggling growth; nine inches to a foot.

Nemophila insignis; bright blue and white, small flower; six to nine inches.

Erysimum Peroffskianum; bright orange; small pretty plant; six to nine inches.

Double Balsams; scarlet, crimson, purple, and white; one foot to eighteen inches.

Sweet Peas; various purples, and whites, and pinks; two to three feet.

Calliopsis bicolor; orange and brown; one and a half to two feet.

Lupinus nanus; purple, spikes of flower; six to twelve inches.

Phlox Drummondii; dwarf red, purple, and all the shades of them; one foot.

Ten-week Stocks; many colours, from Germany, all but yellow; six to twelve inches.

China or German Asters; many colours, all but yellow; one foot.

Now these annuals are the most showy in patches, about the size of a thirty-two-sized pot, and therefore if not sown actually on the borders where they are to flower, should be so sown elsewhere as to be easily removed in patches. But the plants, or rather the annuals we have mentioned, are of two classes; one ought to be sown and thinned out, and allowed to stand where they are to flower; the others ought to be sown, and when large enough, planted out where they are to flower.

Of the former we have the Dwarf Larkspur *Collinsia bicolor*, *Convolvulus minor*, *Lupinus nanus*, Sweet Peas, *Erysimum Peroffskianum*, and *Calliopsis bicolor*; of the latter, French Marigold, *Nemophila insignis*, *Phlox Drummondii*, Ten-week Stock, China Aster, and Balsam, are the better for the check they receive in planting out. But where there is not room to sow all these things where they are to occupy room all the while they are growing without detriment to the garden, the management is as follows:—Sow as many patches of each as you anticipate you will want, in a bed in the back garden or nursery; treat them just the same as you would if they were going to bloom there; thin them properly, not allowing more than sufficient to be together, so as to weaken or draw one another up. Let them all be within the circle marked by a thirty-two-sized pot, and about six strong plants, or from that to eight, even of the smallest subject, is enough. These may be in the nursery bed until they are far advanced towards showing bloom; when the subjects which they are to succeed are quite exhausted, and begin to look untidy, get a box barrow, and as you wheel it round, take your spade and lift out the whole spade-full of earth with the roots of the plants undisturbed, and lift it into the barrow; do this with all you are removing, whether they are exhausted subjects, dead, and done with, or perennials, or bulbs, which have not completed their growth. Then having left in each place the vacancy occasioned by removing a whole spit of earth, carefully water, so as to soak the ground all through below the roots, all the patches in the nursery bed designed for removal to where they are to bloom, and take up each patch with a full spit of earth, so as not to disturb their roots, and remove them to the vacancies you have left in the garden. They may, with very little dexterity, be so well removed as not in the least to feel the change. The instant they are placed in their positions, give the earth all round a complete soaking, and then settle them in their new places. By these means pots are saved and there is only a little more trouble. The sowing of those subjects which are to be planted out may be on a slight hot-bed. Hot stable-dung, a foot high, well pressed down, and six inches of good loam at top, will give heat enough for the purpose; and you may either put on a garden-frame and light, or hand-glasses; but, in either case, a mat should be thrown over all at night to keep in the heat a little. The seeds may be sown in March on this, not too thickly, otherwise it is a waste. If hand-glasses are used, take care that the seeds are sown within compass of the glasses. If a frame is used, the simplest way of sowing is in drills from front to back, and about six inches from one

to the other. The seeds of all the sorts, only require to be well covered, and the soil kept rather moist. As soon as they are up they must have air by tilting the sash or light behind. Moisture must not be forgotten, and the lights must be tilted so as to give abundance of fresh air as the seedlings advance, otherwise they would be drawn up. As soon as they are large enough to handle, thin them out a little, and put the plants that you pull out in by the side of the row instead of throwing them away. A few of the balsams may be potted if you have convenience for them, as they make very pretty pot-plants. Here you may give air all mild days and shut up at night. In a couple of months, if they have had plenty of air to keep them from drawing, they will be in excellent order to plant out into the nursery-bed or the show-garden at once; only recollect the places they are to occupy, the height they are to grow, and the time they are getting into blooming order. By careful observation you can plant many between others that are coming off before the newly planted ones flower. For instance, in May your Tulips are in bloom, late Narcissus, and other things that have to come away soon. The *Nemophila* should be close to the front, but the *Calliopsis*, or *Coreopsis*, is a taller subject, and must be placed behind. The *Erysimum Peroffskianum* is as short nearly as the *Nemophila*. Ten-week Stocks, and German or China Asters must not be far back. But, in a general way, *Mignonette*, *Larkspur*, *Collinsia*, *Nemophila*, *Lupinus*, *Phlox*, and Ten-week Stocks, may be said to belong to the front row, and follow *Crocuses*, *Hyacinths*, *Hepaticas*, *Polyanthus*, *Primroses*, and similar dwarf things; while the Sweet Peas, *Calliopsis*, China Aster, *Convolvulus*, French Marigolds, &c. may be placed a step behind, because they grow taller; and there should also be some other subjects there of a more permanent nature. The annuals, in fact, ought to be an addition only to the perennials, that should always occupy a considerable space. In managing a garden this way, a flower ought not to remain an hour after the bloom decays, but it should be removed with a spit of earth, and something else be placed there with a similar quantity of mould; or if the place is to be filled with transplanted seedlings, why, they need only be pulled up, and the place forked about a little, and dunged, perhaps, before the new ones can be transplanted. On this ground we prefer, even if we have no pots, to plant everything in nursery-beds in patches, so far apart as that we can take them up with a spade-full of earth without disturbing their roots; consequently, keep the show-garden well supplied, not with things that require growing, but with things

ready grown, and all but blooming; the garden then never looks unfurnished. There are no flagging young plants; when one is past its beauty, it gives place to another ready to burst. Let the garden be laid out the same as for the work of a single month. Let there be abundance of all the early-blooming flowers. Let April see all the colours of the rainbow. Whatever has declined in May, turn out to make way for an abundance of May-blooming subjects. Let all that are turned out be taken up with a spit of earth, and all that take their places be removed in the same way. The nursery-bed that gives up the new subjects can receive the old, and the half-perfected bulbs may complete their growth as well as in the original place; meanwhile, in successive nursery-beds bring forward a succession of subjects. The gay Tulip, the China and Damask China Roses, the *Pyrus spectabilis* and *japonica*, Pansies, Wallflowers, double gold colour and dark blood colour; and at such times there must be enough of those in flower to make a good show. In June the difficulty is to select, for there is a blaze of flower, and all the annuals are rapidly aiding the general bloom. All the colours are plentiful, and if the place were extended to thrice its size, we feel that we could fill it. Nor does the next month find us in any difficulty for subjects in flower. The perennials take the ascendant as to beauty, the Carnation and Picotee forming, themselves, a most gorgeous and most delicate subject. The Balsams, among the annuals, are now in perfection; the China Aster, and many other subjects, being gay. The *Delphinium grandiflora*, with its dazzling rich blue flower, towers above the ordinary annuals, and is, for its time, the most striking subject in the place. The Hollyhock plays its part for two months nearly, and before that is done with, the Dahlia begins. And we know of no better way of regulating a garden to be thus supplied, than by cultivating all things in the nursery garden at their proper season, and, when they will bear it, in successive seasons; and as soon as one set of subjects in the show-garden becomes shabby, to replace it with another, carefully removing the defunct, with a spit of earth, to the place where the new subject is to be obtained. If the defunct plant be worth keeping, let it take the place; if it is an annual or biennial, and is useless, let the earth only be placed there and the plants be thrown to the dung-hill. We have given a list of the annuals to be depended on as the chief; we have been guided by their properties; they are the best in cultivation, although there are many more which bear a seed-shop reputation. But, in estimating all annuals, perennials, or other plants in the open air, we have some guiding

properties, without which we value them not. First, we want quantity of bloom; next, length of bloom; lastly, brilliance or denseness of colour. The only exception to these qualities is the *Mignonette*, which we take for its fragrance. The perennials most valued must have some one of these qualities, though there is one which "covereth a multitude" of faults—the season of bloom. If we could find subjects full of blemishes which bloom in December and January, we should make room for them, however we require a choice from the following:—

Crocus; white, blue, and yellow; six inches.

Hyacinths; white, blue, red, and straw-colour; nine to twelve inches.

Jonquils; yellow; nine to twelve inches.

Daffodils; yellow; nine to twelve inches.

Narcissus; white, yellow and white, orange; twelve to eighteen inches.

Crown Imperials; pale straw yellow, and orange; two feet.

Lupinus polyphyllus; dark and light blue, white, blue and white; eighteen to twenty-four inches.

Delphinium grandiflora; grand dazzling blue; three feet.

Hollyhock; black, red, purple, lilac, mottled, yellow, white, &c.; six to ten feet.

Dahlia; shades of red, purple, rose, lilac, yellow, mottled, tipped; three to six feet.

Columbine; blue, red, white, and mottled; two to three feet.

Pinks; white, and laced with rose, purple, dark, &c.; twelve inches.

Carnations; white, striped with rose, purple, dark, &c.; two to three feet.

Picotees; white, laced with rose, purple, lilac, dark, &c.; two to three feet.

Polyanthus; yellow ground, blotched, with dark brown, crimson, &c.; six inches.

Primrose; double purple, double crimson, double white, double straw-colour; six inches.

Hepatica; red, double and single, white, ditto, double blue; six inches.

Yellow Alyssum; bright yellow; six inches.

Anemone; single blue, red, rose, white, and mottled; six to nine inches.

Ranunculus; turban scarlet; six to nine inches.

Scarlet Lychnis; bright scarlet, double; two feet.

These are all excellent subjects, and may be placed where there is a desire not to disturb, but as they all figure in their season, and some are not in flower more than a month or two in the twelve, it may be a question whether any are permitted to hold a permanent place in the garden. Nor is it at all necessary that they should be all cultivated, but there is this advantage in keeping up a garden of suc-

cession,—you have, independently of all the ordinary seasons, the chances of some being later than usual, and others being earlier than usual, so that you may always improve. There is scarcely a plant, whether it be bulbous, tuberous, or fibrous, which may not be well removed if you take a full spit of earth with it, and first soak the ground all round it so that the earth adheres to the roots, and again soak it when it is put in its place, so that the earth may be settled down close to it. The trees and shrubs are necessarily the same, however the rest of the garden may be maintained; and it is not to be forgotten that biennials, such as are worth the culture, may be depended on, but many biennials may be treated like perennials, and be perpetuated by cuttings, and these, perhaps, are the principal useful ones. For instance, the blood and golden double wallflowers are splendid subjects; and flowering early as they do, and yielding the most beautiful aroma, they are in all respects grateful to the sight and smell. There are, however, others, such as the scabious, the Canterbury bell, blue and white rocket; but for the most part they flower when there are so many better things in bloom, that except in very extensive places they are not very useful. The Sweet William is an exception, perhaps, but it is almost a perennial, and is now being produced very double and beautiful, and can always be perpetuated by cuttings, or layers, so that we hardly place it among the useless, but it must depend on the quality of the individual variety as to whether it be worth a place. All the subjects we have mentioned may be grown as we have directed in a nursery garden, in patches not larger than a thirty-two sized flower pot would cover; and the time to remove them is when they are about to throw out their bloom buds, or before, if there be room to fill up and nothing forwarder to place there.

THE MANAGEMENT OF A LIMITED GARDEN BY POT CULTURE.

The advantage of this is, that there is little or no disturbance either to plants or garden, and that it increases the range of subjects in a most extraordinary manner. It enables us to be more choice of our subjects, to be more neat and exact in our arrangements, to keep up a better supply of subjects in bloom, and, in short, to do that with regard to appearance that nothing else will. Our first object is to procure a supply of garden frames; a considerable quantity of pots of the sizes 60, 48, 32 and 24; and to select, in addition to the flowers we have already mentioned, verbenas, dwarf scarlet geraniums, cinerarias, hydrangeas, fuchsias.

These are for bedding out at a proper time,

and as soon as they are in flower. All the subjects intended for transplantation to the principal show garden must be grown in these pots, *Mignonette*, Ten-week Stocks, *Nemophila insignis*, *Phlox Drummondii*, and even *China Aster*, may be sown in autumn and preserved through the winter. These will all be a month or six weeks earlier in flower than others sown in the spring; this enables us to have two distinct seasons with very favourite subjects. We care less about *China Asters* than the others, but the blue of the *Nemophila*, when nothing else blue is in flower to compare with it, is a great feature; and the crimson, scarlet, purple, and white of the stock, and moreover, its rich perfume, make it welcome all the year round, as does the superb aroma of the *Mignonette*; these, then, may be considered as nursed all the winter in frames and forty-eight sized pots. *Verbenas*, dwarf scarlet *geraniums*, *cinerarias*, &c. must also be potted up in autumn from the cutting pans, or preserved in them carefully; but separately potting brings them on best. There may also be a quantity of *China roses*, pale and crimson, kept in pots through the winter in cold frames; nor should we forget small shrubs, *Rhododendrons*, *Azaleas*, *Pyrus japonica*, a few of which may be kept in frames to forward them a little. Then of the plants which are perfectly hardy, let there be a good assortment, a few of every one in appropriate sized pots, which pots are to be plunged in the ground to their rims, half a dozen or more plants each of the subjects you chose; and these are to be in the particular sized pots suitable to their intended station; twenty-four sized pots for the furthest back, thirty-two for those a little forwarder, forty-eight for the front. Besides the subjects mentioned to be kept over the winter in frames, there may be violets, primroses, hepaticas, and other subjects that may be hardy enough, but nevertheless may be forwarded by excluding the severe frosts. *Crocuses*, snowdrops, early tulips, hyacinths, instead of being planted in the earth, should be potted. The only subjects allowed to be permanently fixed in the garden, should be those which are intended as final ornaments, and consist of such evergreen shrubs as shall give a decided feature to the plantation, and the few deciduous flowering trees and shrubs which are to support the general scene. *Holly* is a bright, permanent, handsome, and manageable evergreen, and as it can be restrained in its growth without damaging its appearance, is one of the most useful. The *Laurustinus* is one that should figure prominently; if there are several of them, they are always pretty, often beautiful. The *Pyrus japonica* as a standard or shrub, is curious, and while in flower, which is a good

while, it is very brilliant. However, with the choice of shrubs we shall have nothing to do; let them be uniformly disposed, and in the back ground, so as to support, but not confuse, the general feature of the garden. The earliest flowers may be lavishly supplied, and dwarf evergreens in pots may be placed about among them, to relieve by their green what would otherwise be a mass of flowers. As, however, many of the plants look very beautiful as soon as they emerge from the pots in the ground, the garden may be at once laid out, so that it shall never look bare. Nothing is much prettier than the plant of the columbine, and the *Lupinus polyphyllus*; when they begin to grow, therefore, they may take those places where they are to flower, which will be of course at the back of the dwarf plants. In November, therefore, at the planting of all the bulbs, the garden has to be cleared of all the decaying plants; the chrysanthemums being pretty nearly the only tenants worthy of a place. Let all the evergreens you can muster in pots be placed where you have to remove decaying things from, that the border may not look deserted. Small shrubs of eighteen inches, or two feet, may tastefully fill up the spaces that have been occupied by dahlias, delphiniums, hollyhocks, and similar background plants; pansies, which seem almost to defy the frosts of winter unless they are lasting, violets, the Christmas rose, polyanthus, primroses, and the like, may be placed in their several situations. *Crocuses* and other early bulbs in pots, may be plunged in their places in the foreground, and thus the garden, while provided with the earliest tenants of the spring, may be dressed with evergreens to give it a tolerable appearance. As the chrysanthemums die off and get shabby, up they must come, and the ground will at least look clean and tidy, aided by the living features of dwarf evergreens, varied as may be in foliage and habit.

Dwarf almonds, too, may be placed among them, ready to burst into flower at the summons of the first few sunny days, but provided with the earliest flowering subjects, some of which, such as polyanthus and primroses, will be obtruding their welcome but unseasonable blooms, more or less, all through a mild winter. The snow-drops and crocuses, the violets and hepaticas, very soon after Christmas make their appearance, and from that time all is bright; they no sooner decay than they may be replaced with the wintered annuals. *Nemophila insignis* will, after nursing all the cold weather, open its blue eyes in a very short time. Wallflowers may be brought out and plunged as soon as they show flower. Ten-week stocks will soon afford the aid of their superb bunches of

flowers; and subject after subject will press itself into the service. Late tulips will succeed early ones; and towards the end of May all things may be bedded out without fear of frost. But in March the annuals have been sown as before directed, but in pots instead of the ground; as they come up let them be thinned properly, leaving not more than six or eight larkspurs or other annuals in the pot; they may be plunged or not according to convenience, but they must have constant watering; those which are intended for transplanting, such as ten-week stocks, balsams. *Phlox Drummondii*, French marigold, &c. may be put out three in a pot, and be as carefully tended as if they were in the ground, and here they will grow till they are wanted. When the subjects decay one after another in the show garden, replace them with the most appropriate thing that is ready. The verbenas may be plunged nearest the front, they are naturally dwarf plants, and the most dwarf are the best; they will be blooming pretty soon if they have been taken proper care of. The evergreens may come up partially, if not altogether, to make room for better or more gay subjects. The spring-sown *Nemophila* will be ready to succeed the autumn-sown as soon as it decays. The other annuals will be rapidly advancing towards bloom, and you will be able to remove things the instant they are beginning to get shabby. The ease with which one pot is taken up and another put down will be obvious to everybody; there need not be a handful of earth disturbed, and the pots being sunk just below the surface, nobody will observe them. The hydrangeas will be showy as soon as the flower begins to colour, and remain so for months. Fuchsias will begin to flower in May and June, and continue in bloom a long time. The principal objection made to pot-culture and pot-furnishing is, that the productions are not so large nor generally so fine; some subjects are improved by this as garden plants, but a good deal of this depends upon the manner in which the plants are supplied with water: if the watering be done ineffectually and carelessly, the roots being confined in pots will not get a proper share of nourishment, and the bloom will be shortened in consequence; indeed, the plants may be prematurely destroyed for want of moisture, but if the water be administered properly they will bloom as freely, and the plants be more elegant and far better within bounds, than if left to the open ground, for if they are less rank they will also be less coarse. It will be easily seen that the addition of the verbenas, geranium, hydrangea, fuchsia, and some other half-hardy or greenhouse plants to the stock from which the garden is to be furnished,

enables us to give great additional effect. It will be found frequently that the plants have rooted through the bottoms of the pots; when this is the case, turn the pots round until the roots are released, because the great object is to get the pots out without disturbing the borders and beds any more than we can help, because we want to get the other pots down into the same places with as little litter as possible.

We are here treating of all subjects in a general way, leaving as much as possible to the tastes of all those who adopt this mode of culture, or rather of keeping up a flower garden. By keeping in stock a good variety of subjects, and such as are blooming in all seasons, we provide ourselves with the means of changing the face of the place every week, more or less, and of keeping up such a succession of flowers as can be kept up by no other means. The trouble is greater, (or rather, we ought to say, the opportunities of gratifying our taste are greater, for the one comes with the other,) that is, there is more to attend to than there would be in other methods; but those who see such a garden, well kept up, will wonder how it is possible to keep up such a show of bloom, because as nothing need be in the ground but things bursting into flower, or in full bloom, those places that would otherwise have to be occupied by plants in all the stages approaching bloom will be filled with plants in perfection. But even this may be in some cases departed from with respect to annuals, which are longer in flower in the open earth than when confined in pots; you may, if you please, so far depart from plunging the pots as to turn out those that are useless after flowering, such, for instance, as balsams, sweet peas, and annuals of all kinds; the ball may be turned out whole, and the pots taken for other purposes, because when these things are past their prime they need only be pulled up and thrown away. Towards the fall of the year, the preparation of the bulbs which are best in pots for the spring occupies our attention. The greenhouse plants, such as fuchsias, verbenas, cinerarias, and similar subjects may be taken up, cut close in the roots, shook out, and pruned, the whole repotted in the same sized pots, and consigned to their winter quarters; but the amaryllis tribe and the colchicums may be kept in pots, ready to go out as soon as they make their appearance, and greatly assist in making up, with dwarf evergreens and flowering shrubs, the garden for the winter quarter. Having once been completely bent on keeping up the appearance of a geometrical garden, with twenty-four beds of several different forms in it, we did it entirely by pot culture, and found that though it was not without requir-

ing a good deal of time, it well repaid us by the constant changes we were enabled to effect, and the beauty we were enabled to keep up; but there were times when dwarf evergreens assisted the general effect greatly, and when, but for our stock of subjects in pots, the beds must have been empty or untidy. Upon the whole, therefore, nothing will enable us to keep up the brilliance of a flower garden equal to the provision of abundance of subjects in pots.

GARDENING MEMORANDA FOR NOVEMBER.*

TULIP planting and the planting of bulbs generally comes on this month, and by right should all be completed. Bulbs of all kinds are to be potted this month. Pruning continued until completed, both wall-trees and standards. Raspberry canes should be cut back to four feet high; currant and gooseberry trees the same; and roses which have large heads may be reduced in size, but not closely pruned; the stakes of standard roses must be examined, and their strength proved, or the wind may break off the heads; cuttings of China roses may be put into pots, and placed in any corner of the greenhouse or propagating-house. Cuttings of Camellias may be put in to strike. If there be any fruit not gathered, it is running a great risk not to gather it directly. Where there is any ground-work in hand the best haste should be made while the frost and wet keep off, for either of them coming on to excess will altogether stop the progress of the work. The conservatory requires the best plants that can be found to ornament it; the chrysanthemum, though anything but a good flower, is better than nothing, but the other houses and pits, in a good establishment, will supply many things: the very auricula frame will afford its share, for, in spite of all efforts to prevent it, some will throw up an autumn bloom; the Chinese primrose, cineraria, and many other things come out of season, and the principal care required in the conservatory is to collect all these straggling things and place them well among the permanent inhabitants of the place. The stove, too, will always keep yielding something towards it. The conservatory, however, should be kept close while there are stove-plants or forced flowers in it, for the cold agrees as little with one as the other; besides, unless it is unusually warm, there is no good reason for letting in the external air. All other houses and pits, as before recommended, must be heated as if frost were com-

ing every night, and when it does come must not be opened too soon.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING NOVEMBER.

The Greenhouse.—From forty-five to fifty-five degrees by day, and about forty degrees by night.

The Conservatory.—From fifty-five to sixty degrees by day, and from forty-five to fifty degrees by night. Use fires occasionally in damp weather, to keep the house free from damp.

The Plant-Stove.—From sixty to sixty-five degrees by day, and fifty to fifty-five degrees at night.

The Orchid-House.—The warm or Indian-house, from sixty-five to seventy degrees by day, and sixty degrees at night. The cool or Mexican house, sixty degrees by day, and fifty-five degrees by night.

ON DRAINING.

DRAINING is the operation of providing outlets for the removal of superfluous water from the surface of the soil downwards as far as that water would affect the roots of plants. It is the most important of all preparatory operations in a garden, and should be made the basis of every other improvement: consequently, it is the first practical operation in bringing fresh land under cultivation, and the first step to be taken in improving such cultivated soils as may have been neglected in this respect.

With hardly an exception, all garden soils require, or are improved by drainage. In very light sandy soils on a porous subsoil, deep cultivation, that is, frequent and deep trenching, carried on on sound principles, in great measure takes its place; this process facilitating the passage of what superfluous surface water may fall on the soil. If, however, there are springs, even sandy soils must be well drained.

The water which falls on the surface of the soil in the form of rain or snow, penetrates downwards till it is arrested by a stratum of clay, or some other impervious substance; it then finds its way laterally on the stratum that sustains it, until meeting with an aperture or obstruction—sometimes after travelling a long distance, receiving accumulations in its course—it appears either as a spring or as a body of stagnant moisture. It is the removal of this water, not that which falls in the shape of rain on the particular spot to be drained, that is the object of draining. No soils would require draining were it not for the impervious stratum alluded to, the resistance of which to the downward progress of the fluid, is the

* A very elaborate and complete Calendar of Gardening Operations for November is published in No. 35 of the Horticultural Magazine.

cause of stagnant water. The removal of the latter can only be secured by penetrating and intersecting this stratum with drains or water channels.

Agriculturists, with whom the question of drainage is one of magnitude, are yet divided in opinion as to the actual depth at which it is advisable to form these channels. Some contend for an average depth of four feet,—few less—and some go almost to double that depth. Gardens ought to be drained to a depth of four feet in ordinary cases, and in very retentive soils one or two feet deeper; for the proper cultivation of culinary crops requires at least two feet and a half in depth of soil, below which not less than one foot should be clear of water, and this, allowing six inches for the water channel, fixes the depth at four feet. In stiff retentive subsoils this channel should be deeper from the surface, so as to *draw* the water more effectually from the superincumbent soil, which it effects by the shrinking of the clay causing it to crack in various directions, thus facilitating the filtration of moisture.

The principle of efficient drainage is simple enough: it is like piercing a hole in a vessel containing liquid, by reason of which the vessel cannot retain water at a higher level than the hole. Comparing the soil with the vessel, it is impossible, from the tendency of liquids to find their level, for the soil to contain stagnant water above the level and within reasonable distance of an active drain.

Paradoxical as it may appear, this process of removing the superfluous water from the soil has the effect of rendering that soil moister than it otherwise would be in lengthened periods of drought, provided the superfluity arose from the retentive nature of the subsoil. This is explained by the fact of a saturated soil being a close and unporous one, facilitating evaporation from the surface, while it is incapacitated from drawing any supply by capillary attraction from beneath. An open and porous soil does this, and also absorbs moisture from the “dews of heaven” when in need of a supply, and thus it is maintained in that equably moistened condition which is favourable to vegetation—less damp during periods of wet, and less dry in lengthened periods of drought. Every one must have noticed the parched appearance during dry summers, of soil which at other periods of the year is excessively wet from the cause referred to.

Undrained land becomes injured by excess of water from two causes; the one is, where the subsoil is retentive, and simply prevents the water that falls on the surface from passing downwards; the other is where the superabundant moisture arises from the presence of

active springs, which of course are also owing to an impervious bottom, and are the outlets naturally formed for the liberation of pent-up water. In the first case, the formation of a water channel below the point at which it is desired the soil should be free from this excess of moisture, will effectually draw away the excess whenever circumstances may tend to produce it. In the latter case, the spring, instead of finding for itself an outlet towards the surface, will be cut off, and the stream carried along at a sufficient depth from the surface not to interfere with the operations of culture, nor the growth of the crops. In this view the subject is reduced to its simplest form. The basis of success in draining, is to secure a fall for the collected water. An efficient set of drains must comprise main or conducting channels, and what may be called collecting drains of smaller capacity branching out from the main drains, collecting the water from the soil, and conducting to these principal outlets. In small areas, these two forms of drains will be sufficient; and in most gardens of small size, one of the principal drains will in general be enough to convey away the collected water. Where the space is larger, it is convenient to have three kinds of drains, one main channel in this case being also generally sufficient for a space of, say, three to six acres, into which secondary conducting drains should be led, these latter being fed as before by the regular series of small collecting drains. There may, however, be circumstances on the larger scale intimated above, where one conducting drain will be insufficient: some of these are such as the following:—

1. Where there are two considerable lines of depression in the arrangement of the surface, with an elevated ridge between, in which case a conducting drain will generally be necessary along each depression.

2. Where the surface falls in every direction from a raised central area, in which case two or three conductors proceeding in opposite directions from the highest to the lower levels will be required.

3. Where there is but a very limited fall at command, so that the main drain cannot be carried deep enough to work the distant collecting drains.

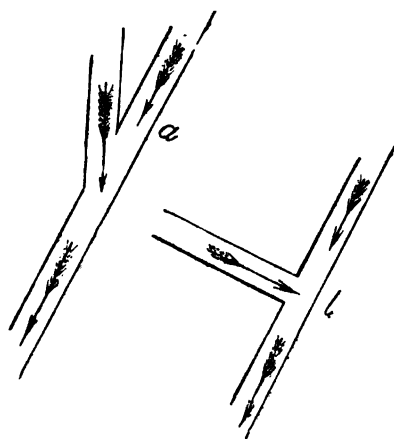
4. Where there is much for the drains to accomplish, in which case it is not desirable to throw too much work on the principal channels.

5. Where there is a large flat area to drain, so that the length of the collecting drains may be shortened.

Of course, no open water-courses are included in these considerations: no one would waste cultivable ground by digging open drains, when the same end is gained by under-

ground drains, which leaves the entire surface available for cropping.

In planning an arrangement of drains, the first consideration is the outlet, which is to be sought at the lowest part of the ground. If the drains can be led into some active water-course, whether it be a sewer, a ditch, a brook, or a river, this will in general answer the purpose, but if this cannot be done, it will be requisite to take care, that when the drains reach the lowest point of the ground to be drained, there is facility for the water they collect to pass away. The leading drains should proceed from near the highest to the lowest points of the ground, these positions being determined by an accurate survey. An exception to this may be allowed, in cases where the surface is very steep, and where consequently a great velocity would be thus imparted to the water, and which would be liable to disarrange the drains. Of every estate, however small, there should be a plan, on which the levels at various points should be accurately recorded for the purpose of reference in matters of this kind. So also with the smaller drains; they should, except in the case of the exception named, proceed from the higher limits of the area they comprehend, downwards into the channels that are to relieve them; where practicable, all the drains should extend in straight lines, the smaller ones running obliquely into the larger ones in the direction of the descent (see *a* in



the sketch). This arrangement offers the least possible resistance to the flow of the water. Where straight lines cannot be followed, easy curves should be substituted. On no account should any sudden curves, or either right or abrupt angles (as at *b*) be allowed.

The fundamental principle of efficient drainage is, that the drains should have a *fall* through their entire length: a level drain, if such were formed, *could not take away the water*. This point has to be borne in mind

in fixing the point or points of outlet, and the relative depth of the different portions. It will be obvious that the lowest end of the drain cannot be below the point at which the water is to flow away; the other ends of the drains must also be deep enough to be out of the way in cultivating the soil, and also to be capable of rendering a sufficient depth of soil dry enough to secure the health of the crops above them. The difference in the level between the two ends will be the available amount of fall, and this is best divided regularly throughout the whole length of the drains. If therefore the amount of fall is very trifling, it is better to have a greater number of main drains, so as to shorten the length of the collecting drains, and also to allot a less amount of fall to the latter, in order to give a greater fall or power to those conducting channels which have to carry away the accumulations of the smaller drains. The difference between a level country and a hilly one, will make it at once apparent that circumstances will be very variable in this respect.

It has already been stated, that in general one main drain will serve for a garden; and this will always be sufficient in small gardens. The distance which should be allowed between the lesser drains, will depend on the nature of the soil and situation—whether it is very retentive of moisture or otherwise, and whether there is a great supply of moisture to carry off, or but a very limited quantity. Supposing the circumstances to be the most unfavourable here indicated, the smaller drains ought to be placed at about fifteen feet apart, and under different circumstances the distance may vary between this, and thirty feet, wider apart than which it will not be advisable to place them under any circumstances. Where, from there being a large flat area to drain, it is desirable to provide more than one main drain, these may be placed at from fifty to a hundred, or two hundred feet apart, according to the circumstances of the situation. In this case there must be three sets of channels, the mains, the secondary conductors, and the collectors.

Drains ought to be well made. The operation is one of those expensive ones, which become still more expensive if they are not at once made complete. It is obvious that if the drains become inoperative, the entire expense of forming them is lost; and it may almost be said to be doubled if the evil is attempted to be remedied, for an amount of labour equal to that of the original formation will in general be involved.

The process is something like the following:—First determine the position of the drains, and have this marked out on the ground by means of wooden pegs, light-coloured, so as to be easily seen; then, having

settled the levels and depths, let this be marked on the pegs at certain points, say at the extreme ends, and wherever there is a junction, and also at intermediate points when they are very long. We should recommend never to make the smaller drains of a less depth than from three to four feet, especially when the soil is very stiff and retentive. The actual fall must depend on circumstances, the difference in the level of the extreme ends being divided proportionally through the whole distance; the main drains may, however, have a fall somewhat more rapid than the others. The fall need not be more than about one foot in a hundred for the small drains, and two feet in a hundred for the larger ones, though a less fall than this will be efficient. As a general rule, drains are better not made very steep, as the velocity which is thus given to the water which passes down them is liable to wear the channels, and displace the materials employed, to an extent sufficient to injure the drains. Where the surface is very steep, the drains should be ranged diagonally, in a zigzag direction, to obviate this inconvenience.

After these preliminaries are arranged, the next point is to dig out the soil for the purpose of depositing the tiles, stones, or whatever other material of drainage is employed. This work is usually done by navigators, or men who are in the habit of doing heavy "ground work." Some slight difference will be necessary in the manner of forming the drains, according to the material to be placed in them, and it is therefore desirable here to digress so far as to notice some of the principal of these materials.

Tile drains are much the best, though they are also the most expensive; but then their durability is an equivalent for this. Ordinary drain tiles show the form of an inverted U, thus (a); they are mostly used in connexion with a flat tile; sometimes the flat is laid at bottom, and the drain tile set on it thus (b), but this is not so good a plan as the reverse way thus (c); the advantage of this latter plan is, that the current, whether large or small, is better enabled to keep the drain always cleansed, and free from sediment, which is not so well secured by the other plan; sometimes two drain tiles are used, placed thus (d), and the advantage of this is that a larger channel is formed, which is sometimes convenient for the larger drains. Besides these, circular or pipe tiles thus (e), are now much employed, and these are perhaps the best; a small calibre—one and a half to two inches—is sufficient for the smaller drains, and larger ones may be used for the principal drains. Tiles of the form just alluded to are also made of various sizes, but the smaller ones,

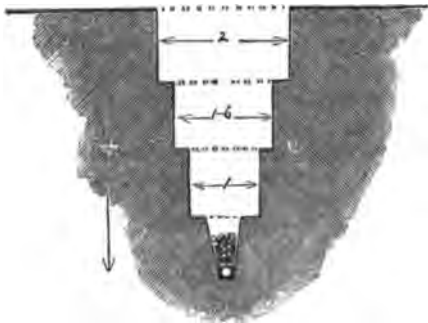
about two inches across, are large enough for the small drains. There are other kinds of tiles employed, as for instance the letter g form reversed, the two edges being widened to form a foot; and the same form with the rounded side downwards, and covered by a flat tile, which, instead of lying over the two sides, drops on to a shoulder or groove, which of course renders it firmer, but involves an unnecessary expense. A modification of the



pipe tile has been employed, in which a flat foot is added thus (f), to prevent it from getting displaced. The pipe-tiles are also formed of a compressed figure, deeper than wide; and some are formed with sockets, which is also a needless expense. The best and cheapest way of securing the tiles from any lateral disturbance, is to have the bottom of the drain cut just large enough to receive them, and no larger. This is in fact just what ought to be done, for the removal of more of the soil than is absolutely necessary is a manifest extravagance. The only difficulty in laying pipe-tiles is experienced when the ground is strong, in which case it is sometimes difficult to render the bottom of the drain as level (plane,) as would be desirable. Sometimes tiles are not employed, but in their stead six or eight inches of rubbly stones are laid in the bottom, and protected at top from being intermixed with the soil by a layer of turf or heath, or material that will not soon decay, in order to keep them constantly open; this is an expensive plan, unless the material happens to be near and inexpensive. At other times, instead of tiles sods of peat earth are used; this material makes very durable drains, and is not expensive; the drains are cut very even, and narrow at the bottom, with a shoulder, and the sods of peat are also cut even, and just so large, that when rammed down quite tight they may be supported by the shoulder at six inches or so from the bottom, leaving the other part below clear and open for the passage of the water; it is essential that the sods should be rammed in tight, and the grassy side should be placed downwards. Many other materials are at various times employed: among the rest, faggot-wood and straw are laid in the bottom of the cuttings; but the use of these perishable materials, though they are comparatively inexpensive at first cost, is altogether opposed to the principle which recognises the permanent character of drains.

To return to the excavating. For a drain of four feet deep it will be necessary to make an opening about two feet wide at the top,

(see the sketch *c*); this may be cleared out about one foot deep. The next foot of the excavation may be brought down three inches narrower on each side, so as to make the width of the bottom when two feet deep, about one foot six inches. The next foot may be six inches narrower. On this the workman stands to clear out the remainder. The upper part, from the top three feet downward, may have taken the form of a gradual slope, or if preferred the sides may assume somewhat of the form of square steps, as in the sketch *c*; the



lower foot of the excavation is taken out by long narrow tools adapted for the purpose, and known as draining tools. One of these is a narrow spade, with a blade upwards of a foot long, three inches wide at the top, and two inches at the bottom, and somewhat hollowed out. The other is a hollow scoop of strong sheet iron, two inches wide, attached to a long handle at an acute angle; this is used to clear out the bottom. This portion of the drain should be dug so that the bottom is just wide enough to receive drain tiles of the size employed, and no wider, and may widen a little upwards. The bottom must be made quite flat, forming a perfectly even inclined plane from the upper to the lower end; the sides near the bottom ought also to be cut tolerably even, especially where peat sods are substituted for tiles.

The soil which is taken out from the cutting must be deposited so as to be replaced nearly as it was before; that is, the top soil should be again placed at the top, and the bottom at bottom. The former has to be laid just far enough away from the cutting to allow the other portions to be laid out without being thrown over, or intermixed with it. The best soil may be thrown on one side, and the inferior on the other, and if any trampling is necessary, it should, as far as possible, be confined to the latter.

Supposing tiles to be employed, the next operation is to place them in the channels thus cut out; this should be done with a pair of rude wooden tongs, the drains being too narrow to allow a man to work at the bottom. They

must be laid quite even and close, and as they are placed down, a stone or brickbat, or something of that nature, is to be dropped on each side, to fix them in the proper position. They are then, if the ordinary shaped tiles, to be covered with the flat (or drain) tiles, which should, as bricklayers say, "break the joints" of the others, that is, the joinings of the two series should not be parallel, but the centre of the upper tiles should cover the joints of the lower ones. This being completed, six inches of some porous material, such as brick rubble or oyster shells, is to be thrown in carefully over the tiles, and on this six inches of clay, or the stiffest soil at hand, is to be rammed firmly down, so that the water may not pass directly down through the top of the drain, but be forced to filtrate through the sides. The remainder of the soil is then to be returned to fill up the trench.

In all cases, that is, both with drain tiles of the ordinary shape, and also with the circular ones, it is quite sufficient if the tiles are placed accurately end to end. There is not the least necessity that one end should fit within the end of the adjoining tile.

As regards the manner of forming a junction, it is best done by bringing the smaller drains at such a level, that their bottom is just even with the top of the tiles in that to which they are to be united. In this case, the end is simply brought exactly over the larger drain, where it is surrounded carefully by open rubbly material, such as stones or brickbats. There is no fear whatever of the water finding its way into the conducting-channel. It is necessary, however, that the junctions between the smaller and larger drains, and of each with one another, should be securely formed. The pipes must be fitted accurately, and should be fixed firmly by the use of any such material as brick-rubble, packed firmly about them. This also should be done throughout the entire length of the drains, in such way that the tiles may not be displaced subsequently to their being laid down. There is no difficulty in securing this, if the rubbly material which is to cover the tops and sides of the pipes is placed about them in a systematic and careful manner.

Where sods of peat are substituted for tiles, the lower part of the opening must be cut very true, the natural clay subsoil in this case forming the sides and bottom of the water-course, while the sods of peat form the top, and prevent the soil from falling in. This mode of draining must only be adopted where the subsoil is firm; such, for instance, as in solid clay; as it will be obvious that if the sides or bottom be of a soft nature, the action of the water in its passage will soon wear away the earth; in which case the peat sods

will fall in, and stop the channel. Neither ought the opening for the passage of water to be large, for the same reason: a width of three inches at bottom, and four inches at top, and a depth of four inches, is quite large enough. To fit tightly into the cutting, so as to form a watercourse of this size, the sods of peat should be seven or eight inches wide, and they should be five or six in thickness. The smaller drains may be formed in this way, in cases where the larger ones are made with stones or tiles.

When drains are formed in a clay subsoil, the expense of providing tiles—for the smaller drains at least—may be avoided in this way: After the excavation is made, a wooden mould, three or four feet long, and of the precise shape of the watercourse,—that is, about three inches wide and four or five inches deep, rounded at top—is provided to place in the bottom; the sides of the drain are cut out rather wedge-shaped; some of the plastic clay is worked to the consistence of thick grafting-clay; and six inches in thickness of this is firmly rammed down on the mould, which is then drawn along, and another portion done in the same way; the mould is drawn forward about two feet at a time, leaving one foot to sustain that previously done, and to form a good junction. In this way, a water-course is formed of the clay, which answers perfectly. The top should be arch-shaped.

Where a stone or rubble-drain is to be formed, the same course of excavation is to be followed, only in this case the calibre of the drain must be larger: four inches wide, and eight inches deep, is desirable. The stones should be covered over with a layer of heath or furze, to prevent the earth from getting intermixed.

Equally as important as the making of drains, is the mapping of them; for, unless this is done in an accurate manner, it will be both difficult and expensive to amend any defects that may present themselves in after years. For this purpose, an outline plan of the estate, on a large scale, should be provided, the position only of buildings and such fixed points as may serve to measure from, being indicated. On this plan the drains should be correctly marked down to measure; and they are best indicated by a different-coloured ink, to distinguish them from other lines, such as those which may indicate fences, &c. When this is done, it is easy in after years to trace the exact position of every drain on the surface of the ground, and, consequently, the least amount of difficulty is experienced in remedying any defects that may arise.

It is with the system of drains formed as

here indicated, that the small grated cesspools placed at the sides of garden-walks and roads to carry away the surface-water, are to be made to communicate. These cesspools should directly communicate with the nearest point of the common drain, by a small drain, formed as already recommended for the collecting-drains. In forming them, nothing is required but a square hole—say a foot across—bricked (without mortar) at the sides, to make it firm, and a foot or so deeper than the bottom of the drain which carries off the water, so that the heavier sediment (which is here likely to collect) may not be carried into the drains. At the top of the brickwork, the grating is to be fixed, so that its upper surface may be level with the part of the walk or road adjoining. A little stony gravel, carefully laid against it on each side, fixes it in its place.

The tools and implements chiefly employed in draining, are—the measuring-rod, in marking out; the level, in determining the fall, and testing the accuracy of the inclined plane formed by the bottom of the cutting; the spade, to remove the upper soil; the draining-tools, consisting of a long narrow-bladed spade, and a scoop set in a long handle, at an acute angle similarly to a draw-hoe, for clearing out the narrow part at the bottom of the cutting; and the rude tongs, to place the tiles at the bottom of the drain. The materials necessary are—drain-tiles, or a substitute; and the rubbly matter which is placed about them. In the neighbourhood of London, a cheap and suitable material for the purpose is sold under the name of “pickings.”

TITLED GARDENERS.

It is a sad, but incontrovertible fact, that persons who shrink at the idea of even entertaining a man contaminated by business, nevertheless descend to the most paltry of all paltry huxtering themselves. They would think their brewer, or baker, or their grocer, very far beneath them, because they are dealers, while they absolutely sell the produce of their gardens. Instead of giving the surplus produce to the poor in their neighbourhood, they sell it to the very shopkeepers, or send it to market, selling for a few shillings enough to give a whole village a treat. How very respectable it looks to see a ducal van, loaded with common garden produce, drawn up side by side with a hard-working market-gardener's, underselling him because the owner does not depend on it for a living! Yet we have seen this at Covent-garden market, and it may often be seen. We could mention fifty noblemen and gentlemen who sell their spare fruit and vegetables, instead of giving them

away; and this is so much the worse, because the price they get is paltry, though by the time the shopkeeper's profits are on the goods, the poor people in the neighbourhood where they are grown, and where they should be distributed free, have to pay a large price. What amount could the fruit and vegetables at Claremont bring at market? What amount could the produce of Chiswick Gardens bring? Why, the stewards of these estates could tell us, not enough to pay for the horses and men employed to prepare, pack, and take them to the place of sale; and yet we have seen royalty and nobility become degraded to market-gardeners, rather than exercise the christian charity so much and properly recommended, and give the spare produce away in the respective neighbourhoods. Yet it is wondered that the poor dislike the rich! It is

thought odd that the industrious classes are disaffected! Let us see how very many people's interests are affected by the selling of rich men's garden produce:—First, there is the poor in the neighbourhood, who deserve the crumbs from the rich man's table, but who must go without them. Next, there is the market-gardener, with whom the duke competes unfairly, because he does not depend on the money for his living, and will sell at any price, so that he knocks down the price of all. Thus the whole class of market-gardeners suffer; and, of necessity, all men employed by market-gardeners. It would, according to our notions, be far more creditable to give away the surplus produce. Let the poor in the neighbourhood be better for it, and the noble owners spared the degradation of becoming dealers and chapmen.



LEUCHTENBERGIA PRINCIPIS.

LEUCHTENBERGIA PRINCIPIS, *Hooker* (noble *Leuchtenbergia*).—Cactaceæ § Cereidæ.

"Few persons," writes Sir W. J. Hooker, in the *Botanical Magazine*, whence our knowledge of this plant, and the materials from which our wood-cut was prepared, were derived, "few persons, we think, on viewing this plant when destitute of flower, would imagine

it to belong to the Cactææ. The mammillæ have rather the appearance of the leaves of some Aloid plant, while the stem, looking as if formed of the persistent bases of old leaves, resembles that of some Cycadææ. The blossom, however, if nothing else, does betray its real character; for it differs in no particular from that of *Cereus*. The whole habit

of the plant is, however, so unlike any other Cactaceous plant, that, for consistency's sake, if *Cereus* and *Echinocactus* are natural and good genera, this will constitute a genus apart; and I willingly adopt a name by which this plant is said to be known on the continent, although I have failed to find the place where any such name is recorded."

The plant is, indeed, as our engraving will evidence, much unlike a *Cactus*; and yet its blossoms are the same in general characters. We already recognise several distinct groups among cactaceous plants, whose differences lie more in the outward aspect of the plants themselves, than in those parts from whence generic definitions are usually drawn; and the present species will—at present, alone—constitute the germ of another and a kindred group.

The magnificent collection of Cacti in the Royal garden at Kew contains the present species, which was procured "from the neighbourhood of Rio del Monte, in Mexico, through the favour of John Taylor, Esq."

The Kew plants are about a foot high, erect but crooked, the stem as thick as a man's arm, and covered over with the densely placed persistent bases of old mammillæ, or with the mammillæ themselves, withered and shrunk into a series of closely pressed scales; these occupy the base of the stems. In the upper part, where the mammillæ are perfect, they are leaf-like, three or four inches long, three-cornered, with the apex truncated, this truncated apex bearing a tuft of six or seven glumaceous linear-subulate scales, of which the central one is longest; these scales are triangular below and flexuose above, and are found only on the upper part of the plant, on the younger mammillæ, becoming at length deciduous. The perfect mammillæ are of succulent texture, and a glaucous green colour; below, they become gradually withered and imperfect, the scales being thrown off, and themselves more or less shrunk, until at the base they assume the scale-like appearance already described. The flowers are solitary, growing from the axils of the mammillæ in the crown of the plant, not numerous, but large and showy, being four inches or upwards in diameter, and of a clear sulphur-yellow colour; they are formed of a number of oblong imbricated greenish scales in the outer series, gradually changing inwards into longer and more coloured scales, and at length into a ray of numerous acute linear glossy petals of a yellow colour. In the flowers of the Cacti, as in those of some other plants, the transition from calyx-scales to petals is so gradual and uninterrupted, that it is impossible to assign limits to these organs, which in other plants are usually so distinct and

easily separable. The water lily is another plant in which this graduated change may be very easily seen.

The *Leuchtenbergia* will require the same kind of treatment as is usually given to the dwarf cacti, the principal features of which may be included in the heads of situation, soil, and watering. As regards the first, these plants thrive best in a dryish warm greenhouse, that is to say, one in which the usual source of dampness (a lavish supply of water) is in winter totally avoided, very little being applied at that season, and that little at distant intervals; in which a little fire heat is given through the spring and early summer months, accompanied by a moderate increase of water, to induce a development of the plants; and in which advantage is taken of the summer sunshine to give the plants as it were a "roasting," in order to mature and consolidate the newly formed tissues, to elaborate the crude juices, and to generate a crop of blossoms. The soil which is to be regarded as preferable is a compound of sandy loam, considerably intermixed with potsherds and charcoal, broken to the size of nuts or walnuts, according to the size of the plants, and with sand, in proportion to its own sandiness, to render it perfectly permeable to water; for which purpose, moreover, the pots used must be well drained with from one and a half to three inches of broken potsherds, and should not be too large in proportion to the size of the plants and the number of the roots.

Manures and stimulating composts are not to be recommended; where, however, there is a command of heat in spring to keep up their growth, they may be sometimes watered with weak clear manure water; but this should be in a very diluted state, so as to admit of its being applied frequently during that stage of their progression. In other respects as to watering, a keen eye and close hand is requisite. During winter scarcely any is needed, unless the plants become excessively dried; then a watering may be permitted, but no unnecessary moisture should be created, nor ought the plants to be wetted. In the spring, with an increase of heat, more moisture may be allowed, but it must be increased very gradually, and at the same time both at the root and in the atmosphere; even in this stage, however, less moisture must be allowed than is usual to other plants; not, however, because these cacti will not endure water, for some of them have been grown as aquatics, but because in inexperienced hands it is safest to adopt a medium course, which also in this case is abundantly sufficient to secure a healthy and rapid development of the plants.

When newly imported plants are received, they require very great care in the application

of water, and also as regards the situation in which they are placed ; for in consequence of the bruises which they usually sustain during their transit, they are very liable to rot, especially if of considerable size. They should be potted in pots nearly filled with broken crocks, with a little open soil at top, among which the roots (if any) should be carefully adjusted. In this state they should be set into a dry warm atmosphere, and very little or no water applied until their roots have taken hold of the soil ; then they may be regarded as in a comparatively safe state, and may be treated as the established plants.

Besides the plan of rearing from the seed, which is rather tedious in the case of these plants, they may be propagated by detaching and planting separately such side shoots as may be produced by the plant, either naturally, or in consequence of the destruction of the central crown—a course often resorted to when propagation is desired.

THE FLOWER GARDEN OF THE POETS.

THE Book of Nature, as it has been not inaptly called, has in all ages of the world been the source whence mankind have learnt lessons of various import, grave or gay, sportive or severe, according to the aspect under which it is considered ; in its gentler pages displaying the goodness of the Creator, in its wilder and more magnificent ones his majesty and sublimity ; in both, conveying stores of wisdom by teaching the heart

"To look through nature up to nature's God."

Few persons are so entirely engrossed by the pleasures or cares of this life, as to be wholly unobservant of the beauties of nature, or insensible to the enjoyment which the contemplation of them procures—an enjoyment which, pure in its nature and ennobling in its effects, increases in intensity as it is pursued with more ardour. On almost all is bestowed the faculty of deriving pleasure from the varied effects of light and shade, the different combinations of colours, the undulations of hill and dale, wood and fountain, that make the whole earth one ever-changing but most exquisite picture ; but it remains with the thoughtful observer to draw from them the lessons of wisdom which they are capable of imparting. It is not enough that the eye alone is gratified by the contemplation of these objects. Who can doubt but that they were designed for higher purposes—to awaken the mind to a perception of the beauty, order, and beneficence reigning throughout the universe, and to fill the heart with sentiments of thankfulness and joy ?

This wonderful book has ever been the peculiar study of the poets, who are fitted by

their organization to receive impressions of beauty, and to extract sweets from every object presented to their view, and endowed with the power of clothing their thoughts in language which cannot fail to sink deep into hearts attuned to something nobler than the too prevailing calculations of mere personal interest. To the poets seems to have been committed the task—a task how noble !—of showing how to

"Find tongues in trees, books in the running brooks,
Sermons in stones, and good in every thing."

It is, then, in those works of poetry with which every language is adorned, and none more richly than our own, that we must look for an assemblage of the most beautiful images and elevating ideas drawn from this fertile source. Culled by a variety of tastes, they are as varied as the occasions that called them forth ; the poet of the passions, seeking to illustrate the darker or more profound traits of character, has recourse to the terrible,—to the tempest, to the boisterous and wrathful swell of the ocean, to the river that, overflowing its banks, spreads desolation and misery as it rushes irresistibly onward. The poet wishing to inspire sentiments of reverence and devotion, finds in the grandly beautiful fitting agents for his purpose. But the grand and terrible oppress while they elevate. We cannot long support the pressure of feelings too highly wrought, and turn for relief to the contemplation of humbler objects more gentle and soothing. Thus the aspect of a country smiling under the hand of cultivation, the peaceful flow of the stream, which enriches as well as diversifies the land through which it takes its course, the heavens studded with thousands of gems, but above all, the endless beauties exhibited in the vegetable world, have ever been favourite themes for the poet's song, and have found a ready echo in the bosoms of all mankind, for they strike the chords of feelings most deeply implanted in our nature.

Flowers, perhaps, possess the strongest and most universal charm. They are associated with the recollections of our earliest pleasures, and the cultivation of them often forms the solace of our after years, when the heart, wearied of the occupations of the busy world, remains true to this pure enjoyment, which links us, as it were, with the happy period of childhood,

"When the earth turn'd around us with fairy delight,
And when daisies and buttercups gladden'd our sight,

Like treasures of silver and gold."—CAMPERELL.

They are appropriate ornaments wherever wealth and luxury have brought together all that is rich and rare in art and skill, and throw an air of elegance around the humblest

dwelling. They deck alike the brow of beauty in her pride, and the coffin in which she lies lowly, when her brief dream of existence is over. Wherever there is a true love of flowers, there is also a native refinement; and the eye accustomed to contemplate their exquisite forms, glowing colours, and graceful intermingling of blossom and leaf, cannot fail to acquire a delicacy of taste and perception, that will exert the most felicitous influence on the character and manners.

In sauntering through the flower garden of the poets, we will consider some of the flowers that have been most distinguished by the tuneful tribe, and give a few of the passages illustrative of them. Foremost in the rank may be placed the Daisy, that "bonnie gem," which rears its humble head in the wildest and most cultivated spots—where the situation seems most adverse, and where most propitious. It blooms in every season, delighting us with its cheerful appearance when all the rest of Flora's train have hid themselves from the rude approach of winter.

"This bold flow'ret climbs the hill,
Hides in the forest, haunts the glen,
Plays on the margin of the rill,
Peeps round the fox's den.

"Within the garden's cultured round,
It shares the sweet carnation's bed,
And blooms on consecrated ground,
In honour of the dead."

J. MONTGOMERY.

Most readers, it is presumed, are familiar with Burns's exquisite lines on this "wee modest crimson-tipped flower;" they are in that poet's most felicitous manner, and strongly expressive of the intense love and feeling for nature which characterize all who are endued with genuine poetic spirit:—

"Gauld blew the bitter biting North
Upon thy early, humble birth,
Yet cheerfully thou glinted forth
Amid the storm,
Scarce reared above the parent earth
Thy tender form.

"The flaunting flowers our gardens yield,
High sheltering woods and wa's maun shield,
But thou beneath the random bield
O' clod or stane,
Adorns the tryste stibble field,
Unseen, alane."

The daisy is a striking emblem of cheerfulness and modest confidence; virtues that shine with equal lustre in the highest and lowest stations, but are most amiable when exercised under the pressure of adversity. When oppressed with cares and anxieties we pine for relief, how soothing is the sight of some loved face beaming on us with cheerfulness and affection, arising from a heart which, "forgetting its own griefs," seeks only how best to console us! How gladly we yield to its

sweet influence! Thus the "daisy," the "poet's darling," is as

"A friend at hand to scare
Our melancholy."—WORDSWORTH.

But it possesses another charm—it is constant; unawed by

"The prouder beauties of the field,"
it is content to

"Lift up its unassuming head
In humble guise,"

when spring and summer are richest. In autumn it decks the field, and forsakes us not even when all the rest of Flora's train have hid themselves from the rude approach of winter.

"Companion of the year,
It smiles upon the lap of May,
To sultry August spreads its charms,
Lights pale October on its way,
And twines December's arms."

J. MONTGOMERY.

Wordsworth has not withheld his tribute of praise from a flower which he calls the "poet's darling;" he

"Did gladly Nature's love partake
Of the sweet daisy;"

and in a strain full of beauty, and expressive of admiration, ascribes to it a power over the passions, which would, perhaps, be felt with equal force only by the highly imaginative.

"If stately passions in me burn,
And one chance look to thee should turn,
I drink out of an humbler urn—
A lowlier pleasure;
The homely sympathy that heeds
The common life our nature breeds,
A wisdom fitted to the needs
Of hearts at leisure.

"When, smitten by the morning ray,
I see thee rise alert and gay;
Then, cheerful flower, my spirits play
With kindred gladness.
And when at dusk, by dews oppress'd,
Thou sink'st, the image of thy rest
Hath often eased my pensive breast
Of careful sadness."

Thus we see a small flower, though perhaps despised by the fastidious votaries of luxury and fashion, who will not see beauty in that which is not costly, exciting in the mind of the poetic observer lively sensations of pleasure and admiration, now lulling to rest his "stately passions," now easing him of "careful sadness," now kindling in him a "kindred gladness."

One of the most charming blossoms of the early year is the Snowdrop, that

"Where no rival flow'rets bloom,
Amid the bare and chilling gloom
A beauteous gem appears."

It is indeed a "beauteous gem," with its snow-white petals and emerald eye, its name

so poetically indicative of its appearance. It is "winter's timid child," that

"All weak and wan, with head inclined,
Its parent breast the drifted snow,
Trembles, while the ruthless wind
Bends its thin form."

Not in vain does it

"Awake to life, and fling around
Its fragrance mild."

Its coming is hailed with delight, for it awakens in us a thousand anticipations. Already we begin to forget the boisterous gloom of winter, and, carried forward by imagination, to revel in the luxuriant vegetation of the coming seasons.

"Where'er we find thee, gentle flower,
Thou still art dear and sweet to us."

A sweet perfume is borne upon the mild air, and forces itself, hesitatingly as it were, upon our sense, so faint, so delicate is it. Attracted by it we seek the cause, and find, springing amid a cluster of fresh green leaves, a lovely flower,

"Whose modest form, so delicately fine,
Was nursed in whirling storms,
And cradled in the winds."—KIRKE WHITE.

It is the early primrose, opening its "tender elegance" to remind us of the bright days to come, to gladden us with the assurance of the approach of the joyous spring; whom

"When young Spring first question'd Winter's right,
And dared the sturdy blusterer to fight,
On a bank he threw,
To mark his victory."—KIRKE WHITE.

The poet, in this effusion, after describing this flower, the rose of spring, draws from it a beautiful illustration:—

"In this low vale, the promise of the year,
Serene thou open'st to the nipping gale,
Unnoticed and alone,
Thy tender elegance.

"So virtue blooms: brought forth amidst the storms
Of chill adversity, in some lone walk
Of life, she rears her head
Obscure and unobserved;

"While every bleaching wind that on her blows,
Chastens her spotless purity of breast,
And hardens her to bear
Serene the ills of life."

A love of flowers, and a perception of their beauty, is not confined to any age or station; the child seizes eagerly upon them, attracted by their gay colours; the cottager loves to cultivate them in his small plot of ground, and hears with pride the praises of the passer-by on his successful care. The Primrose is one of that class of flowers that seem to have most largely enlisted the sympathy of mankind, and to be most closely connected with our happiest associations.

"Where its fairy flowers in groups are found,
The schoolboy roams enchantedly along,
Plucking the fairest with a rude delight;

While the meek shepherd stops his simple song
To gaze a moment on the pleasing sight;
O'erjoy'd to see the flowers that truly bring,
The welcome news of sweet returning Spring."

Is the Heath, the "flower of the waste," worthy of a place among the courtly flowers of the garden, or will its gay denizens look with scorn upon its humble growth and lowly mien? Yet it is beautiful,

"The gem of the heath! whose modest bloom
Sheds beauty o'er the lonely moor;"

empurpling with its wild luxuriance of blossom, the otherwise barren land; and,

"Though it dispense no rich perfume,
Nor yet with splendid tints allure,"

it is dear to the hardy mountaineer; it is the

"Flower of his heart, whose fragrance mild
Of peace and freedom seem to breathe."

If he wander in distant lands, how does his heart warm at the recollection of this ornament of his native home! his patriotism is fed and strengthened by it, and, pining to return to the scenes of his first joys—

"How must his aching heart deplore,
That home and thee he sees no more!"

MRS. GRANT.

Let us now turn our gaze to that shady nook, where deep in its recesses—

"Folding her green scarf like a bashful maid
Around, to screen her from her suitor suns,"

yet,

"But by her ambrosial breath betray'd,"

stands—

"Half in elegant relief display'd,"

the Lily of the Valley;

"The Medicean statue of the shade."

WIFFEN.

This is one of the most lovely of flowers; small, delicate, graceful in form, rich in perfume, its bell-shaped blossoms nestling amid its circlet of soft green leaves, as though to escape the observation which its many charms attract, it has excited universal admiration, and is prized far above many of its more gaudy sisters:—

"It is the emblem of purity,
Relics ye are of Eden's bowers,
As pure, as fragrant, and as fair,
As when ye crowned the sunshine hours
Of happy wanderers there;
Fallen all beside the world of life,
How is it stain'd with fears and strife!
In reason's world what storms are rife,
What passions rage and glare!"

"But changeful and unchanged the while
Your first and perfect form ye show,
The same that won Eve's matron smile
In the world's opening glow.
The stars of heaven a course are taught
Too high above our common thought:
Ye may be found if ye are sought,
And as we gaze, we know.

"Ye dwell beside our paths and homes,
Our paths of sin, our homes of sorrow
And guilty man, where'er he roams,
Your innocent mirth may borrow.
The birds of air before us fleet,
They cannot brook our shame to meet,
But we may taste your solace sweet,
And come again to-morrow.

"Ye fearless in your nests abide,
Nor may we scorn, too proudly wise,
Your silent lessons." KEBLE.

Thus affectionately does the poet apostrophize this exquisite flower, "the virgin-queen of spring," and from the consideration of it derive solace and instruction. The following description by Wiffen is elegant, and full of poetic fancy:—

"Lock'd in the twilight of depending boughs,
Where day and night commingle, she doth shoot,
Where nightingales repeat their marriage vows;
First by retiring wins our curious foot,
Then charms us by her loveliness to suit
Our contemplation to her lonely lot,
Her gloom, leaf, blossom, fragrance, form, dispute
Which shall attract most belgards to the spot,
And loveliest her array, who fain would rest
unsought.

"Her gloom, the aisle of heav'nly solitude;
Her flower, the vestal Nun who there abideth;
Her breath, that of celestials meekly woo'd
From heaven; her leaf, the holy veil which hideth,
Her form the shrine where purity resideth,
Spring's darling, Nature's pride, the Sylvan's queen.
To her at eve enamoured Zephyr glideth;
Trembling she bids him waft aside her screen,
And to his kisses wakes, the Flora of the scene."

The flower to which we now direct our attention forms one of the strongest contrasts afforded by the whole floral world to that which we have just been considering. The one meek, retiring, hiding itself from the eye of day; the other tall, glowing, flaunts its gay colours to the sun's bright beams, and seems to court the admiring gaze of the passer-by; the one having no scent, while the other exhales the most delicious and pleasure-giving perfume:—

"Behold the gay Tulip, here pause and admire,
How stately it rears its proud head,
Deck'd out in the richest of Nature's attire,
The queen of the whole flower-bed.
To the genial sunshine its bosom it spreads,
And wantonly sports in the gale,
Then folds itself up when eventide sheds
Its gloom o'er the thickening vale."

Thus do we see the gay votaries of pleasure flutter in the sunshine of prosperity, content to sip its sweets awhile, satisfied with its vain empty amusements, but who, not sustained by true virtue and fortitude, shrink at the first blast of adversity's trump, and fade away. The tulip has many admirers, and truly with great reason; it makes its appearance at a season when few other flowers greet us, and is one of the most showy and splendid of the painted glories of the garden. Its tints are

not merely brilliant, they are harmonious, as are all the combinations of colours that nature throws together. The tulip also teaches its lesson—its beauty is transient.

"But soon, gaudy tulip, thy beauty must fade,
Short, short is thy season of pride;
It was thus with the crocuses down in the shade,
They flourish'd, then sicken'd and died."

Every one of the productions of nature is beautiful; each one, whether it is destined for the service and notice of man, or runs its course in obscure remote spots, neglected and unseen, possesses some grace peculiar to itself, some idiosyncrasy of beauty. So in all flowers is to be traced the working of Infinite Skill, equally displayed in the despised weed that is plucked up only to be cast away with scorn, as in the pride of the parterre. Field flowers have, amongst others, had their meed of praise, and been celebrated in melodious numbers. Campbell has addressed some beautiful lines to them, which mark the influence they may have on elegant and sensitive minds:—

"Ye wild flowers! the gardens eclipse you, tis true,
Yet, wildings of nature, I doat upon you,
For ye waft me to summers of old;
When I thought it delightful your beauties to find,
And the magic of nature first breathed on my mind,
And your blossoms were part of her spell.

"Earth's cultureless buds, to my heart ye were dear,
Ere the fever of passion, or ague of fear,
Had scathed my existence's bloom;
Once I welcome you more, in life's passionless stage,
With the visions of youth to revisit my age,
And I wish you to grow on my tomb."

Another poet has made them the subject of his verse, and drawn from them a moral which it would be well to remember more frequently:

"Flowers of the field! how meet ye seem
Man's frailty to pourtray!
Blooming so fair in morning's beam,
Passing at eve away.
Teach this, and oh! though brief your reign,
Sweet flowers, ye shall not live in vain.

"And say that He, who from the dust
Recalls the slumbering flower,
Will surely visit those, who trust
His mercy and his power;
Will mark where sleeps their peaceful clay,
And roll, ere long, the stone away."

Blackwood's Magazine.

How many and varied are the flowers that attract the eye as we stroll by the hedgerow; the daisy, the soft-eyed primrose, the love-sick crowslip,

"All deck'd in robe of glossy gold,
With speckled crown of ruby stains;"

the incense-breathing violet, the tangled vetch, the burnished king-cup, and the sweet blue bell.

"Blue bell! how gaily art thou drest,
How neat and trim art thou, sweet flower.
How silky is thy azure vest,
How fresh to flaunt at morning's hour!

"Couldst thou but think, I well might say,
Thou art as proud in rich array,
As lady blithesome, young and vain,
Pranked up with folly and disdain,
Vaunting her power.

Yet, sweet flower,

"What is vain distinction, say,
But the short blaze of summer day?
And what is pomp, or beauty's boast?
An empty shadow, seen and lost;
Such is thy power—
Vain flower."

MRS. ROBINSON.

What is that flower that gleams so modestly among the rushes on the river's bank? Its blossoms are of a soft pale blue, that rivals the lustre of the turquoise; it is small and unobtrusive, but there beams a fascination about it, and we stoop to gather it, when it whispers "Forget-me-not." Yes, sweet flower! long will thy sweetness haunt the memory, like the remembrance of a small calm eye, beaming its first avowal of affection. The Forget-me-not, as its pretty fanciful name implies, is a pledge of friendship, and an appropriate and eloquent offering to a beloved one.

"This modest little flower,
To friendship ever dear,"

also marks the spot where sleep the remains of many a brave man who fell in his country's cause, and has no other monument than the Forget-me-not, which blooms in singular profusion on the plains of Waterloo.

"What flower may grace the spot
Where sleep the relics of the dead,
For whom the secret tear is shed,
Like that which from the grave's cold bed
Repeats—'Forget-me-not!'"

But we are lingering too long amid the wildings of June, and forgetting the many other bright flowers that stand in proud array awaiting our attention,—all attractive and lovely, but one is preeminently so; perfect in form, varied in colour—now of a rich pink, its damask petals now of the deepest crimson, now of the purest, most delicate white, now tinted with the softest blush, it lifts its lovely head towering above its green pedestal, not boldly, but, as it were, with a sweet consciousness of beauty.

"The Rose, the sweetly blooming rose,
Ere from the tree 'tis torn,
Is like the charm which beauty shows,
In life's exulting morn."

The rose is the acknowledged favourite—the queen of flowers, upon which have been lavished the praises of poets, the admiration of all mankind: from it have been drawn the sweetest images; to it we are indebted for many an exquisite thought, to which its elegance gave birth. It flourishes where the sun's rays are tempered to softness, and where they burn with greater fierceness and ardour.

In all ages, in almost every clime it grows, charming the eye and sense; everywhere welcomed, everywhere regarded with delight, it approaches the nearest amongst flowers to the image of that perfection which breathes everywhere, pervades everything. It is the emblem of love; to it the lover addresses his passionate aspirations, with it the bride adorns her tresses, and the bereaved mother places it, bedewed with tears, upon the coffin of her departed little one, a type of its innocence.

"How much of mem'ry dwells amid thy bloom,
Rose! ever wearing beauty for thy dower!
The bridal day, the festival, the tomb,
Thou hast thy part in each, thou stateliest flower.

"Rose! for the banquet gather'd and the bier,
Rose! colour'd now by human hope or pain,
Surely where death is not, nor change, nor fear,
Yet may we meet thee, joy's own flower, again."
MRS. HEMANS.

Lovely is it under all circumstances, yet—

"The rose of the valley, when dripping with dew,
Is the sweetest in odour, and brightest in hue."

So, according to another great poet—

"The rose is fairest when 'tis budding new,
And hope is brightest when it dawns from fears;
The rose is sweetest wash'd with morning dew,
And love is loveliest when embalm'd with tears."
SCOTT.

The idea expressed in the following lines is simple and pretty:—

"Thou blushing rose, within whose virgin leaves,
The wanton wind to sport himself presumes;
Whilst from their rifled wardrobe he receives
For his wings purple, for his breath perfume."
FAIRBANKS.

One singularity is attached to this flower, which we believe is peculiar to it. Its leaves exhale perfume even after its beauty has withered; like the memory of a great and good action, which lives when he who performed it has resigned his place among the living.

"Yet the rose has one powerful virtue to boast,
Above all the flowers of the field;
When its leaves are all dead, and fine colours are lost,
Still how sweet a perfume it will yield!"

So sang the good Dr. Watts. Moore has also referred to this exquisite peculiarity, in a verse of one of his most exquisite lyrics:—

"Let fate do her worst, there are visions of joy,
Bright dreams of the past, which she cannot destroy;
That come in the night time of sorrow and care,
And wear the bright forms which joy used to wear.

"Long, long be my heart with such memories fill'd,
Like the vase in which roses have once been distill'd;
You may break, you may ruin the vase, if you will,
But the scent of the roses will hang round it still."

How does the elegant fancy of this true poet beam through his writings, and invest them with the halo of genius!

The Myrtle, in "modest sweetness drest," is one of Nature's many favourites that has

found welcome with all. Its glossy leaves of sober green, contrasting with its tender white blossoms, charm us with their elegant simplicity. It possesses yet another claim to our affection: it is an evergreen,—truth's consecrated tree, retaining its freshness and fragrance, even through the chill blasts of winter.

"Nor chilling breeze, nor drizzling rain,
Thy glossy leaves can spoil;
Their sober beauties fresh remain,
In every varying soil.

"When life's disastrous scene is fled,
This humble boon I crave;
Oh! bind thy branches round my head,
And blossom on my grave."

Mrs. Robinson.

This fragrant plant was much esteemed by the ancients, (whose true taste discovered and honoured whatever was beautiful,) and by them considered sacred to Venus.

Who admires the staring Sunflower, with its great eye turned constantly towards the sun,* to which alone it renders homage and devotion?

"As Phœbus in radiant glory burns,
From east to west his visage turns."

Yet, if we examine it, we shall find it to be not unworthy the hand that produced it. Its broad disc seems composed of petals of burnished gold, and the regularity and order with which they are interwoven entitle it to rank among the beautiful. And is there not something touching in its faithfulness to the bright orb of day? In its beams it rejoices; deprived of them, it pines and droops. It is emblematic of woman's love, which knows no change, and is attracted by no other object. This flower has been made the subject of some elegant lines—

"Behold, my dear, this lofty flower,
That now the golden sun receives;
No other deity has power,
But only Phœbus, on her leaves.
As he in radiant glory burns,
From east to west his visage turns.

"The dial tells no tale more true,
Than she his journal on her leaves;
When morn first gives him to his view,
Or night that her of him bereaves.
A dismal interregnum bids
Her weeping eyes to close their lids.

"Forsoaken of his light, she pines
The cold, the dreary night away;
Till in the east the crimson signs
Betoken the great god of day.
Then lifting up her drooping face,
She sheds around a golden grace.

"Oh Nature, in all parts divine,
What moral sweets her leaves disclose!
Then in my verse her truth shall shine,
And be immortal as the rose.
Anacreon's plant, arise, thou flower
That hast fidelity thy dower."

LORD THURLOWE.

From the sunflower let us turn to the Evening Primrose, which is in every respect the reverse of the former. Of a soft gentle hue, and retiring simple grace, it loves to open its "cup of paly gold" when the sun has withdrawn his fierce rays, and to greet the view of chaste eve, as she comes stealing on, spreading her twilight mantle over the deepening landscape.

"Fair flower, that shunn'st the glare of day,
Yet lov'st to open, meekly bold,
To evening's hues of sober gray
Thy cup of paly gold;

"I love at such an hour to mark
Thy beauty greet the night breeze chill;
And shine 'midst shadows gathering dark—
The garden's glory still."

This is a property which could not fail to attract the curious observers of nature, and in the short poem above quoted it is applied to the following elegant illustration:—

"For such, 'tis sweet to think the while,
When cares and griefs the breast invade,
Is friendship's animating smile,
In sorrow's dark'ning shade.

"Thus it bursts forth like thy pale cup,
Glist'ning amid its dewy tears;
And bears the sinking spirit up,
Amid its chilling fears."

BERNARD BARTON.

The delicate Harebell can never be viewed with a careless or indifferent glance. Look at its drooping bells of clearest blue, depending from a stalk of such light fragile texture, that it appears scarcely able to support even its lovely burthen, that trembles to the lightest breeze. It grows in the hedgerow and in the field, and may be seen amid ruins, brightening their gloom:—

"Mid ruins tumbling to decay,
Thy flowers their heav'nly hues display,
Still freshly springing,
When pride and pomp have pass'd away,
To mossy tomb and turret gray
Like friendship clinging."

But this little flower, like its gayer and cultivated sisters, has its poetic meaning, which the poet in the following lines has de-
e-yphered and woven into his verse:—

"But most I love thy azure braid;
When brighter flowers are all decayed,
Then thou appearest,
Stealing beneath the hedgerow shade,
Like joys that linger as they fade,
Whose last are dearest.

"Thou art the flower of memory;
The pensive soul recalls in thee
The year's past pleasures;
And, led by kindred Joy, will flee,
Till back to careless infancy
The path she measures."

The transition is not great from the harebell, the last of summer's joys, to the Ivy, with its berries harsh and crude, which circles the whole year, and wears in winter the same

* This favourite poetic idea is a poetic fiction.—Ed.

sombre green, that, though then cheerful, yet, contrasted with the bright colours which vegetation assumes during the other season, appears gloomy. It is the companion of ruins; "creeping where no life is seen," it clings round the moss-grown tower, over the high battlemented turret, and the old building whose glory has faded, and which stands a silent yet most eloquent monument of other years. It is thus associated with images of sorrow and decay. But in all nature's works there is a joyous spirit, which speaks in intelligible tones to all who have within them a sympathetic feeling; nor is the ivy without this characteristic—

"It is not gloomy—brightly play
The sunbeams on its glossy green;
And on it softly sleeps the ray
Of moonlight all serene.

"It changes not as seasons flow
In silent changeless course along;
Spring finds it verdant, leaves it so;
It outlives summer's song.

"Autumn no wan or russet stain
Upon its fadeless glories flings;
And winter o'er it sweeps in vain,
With tempest on his wings."

MRS. HEMANS.

We have thus extracted a few of the sweets contained in the Flower Garden of the Poets, and must here close our survey of the enchanted spot, where are assembled so many beauties, from which has in various times been culled so much that is graceful and elevating. Much remains that our limits forbid us to notice; but what has been said will, it is hoped, lead some who may not already have done so, to look upon them with an inquiring spirit, and distil from them the wisdom which they in common with all the productions of nature are capable of yielding.

"Your voiceless lips, O flowers! are living preachers,
Each cup a pulpit, and each leaf a book;
Supplying to the fancy numerous teachers,
From loneliest nook."

THE USES OF LIME.

Few gardeners rightly appreciate the value of lime; but we have had opportunities of seeing it applied in so many ways, and for so many purposes, that we feel the necessity of communicating some of them. At this juncture—while we are, in fact, writing—there is a general complaint of mildew among cucumbers, and disease among potatoes. We have seen lime applied in both these cases, with the greatest possible success; but it must be properly applied. It must be applied wherever there is the disease: nothing short of this will do. If any part which is attacked be left, of course that part will not be affected with what does not touch it. In case of cucumbers,

we have seen a dredging-box applied, and the powdered lime applied under as well as over the leaf, while the steam, which in the morning is like so much dew, is upon the foliage; and the effect has been almost instantaneous. The parts too far gone to recover have dried up, and the healthy portions, however small they may be, have been left; even half a leaf has been seen to live well, while the other has shrivelled up as if it were burned. We have seen the same frame that appeared reduced to mere skeletons of plants, recover so completely in a month, as to be full of healthy plants. Applied with a sieve on the open ground to cucumbers in ridges, some plants perfectly recovered, others never rallied at all. We take this to be accounted for by the disease having made, in some plants, too great a progress before the lime was applied, and that it had not made so much progress in those which perfectly recovered. Or it may have been, that the lime only covering the upper surface, the portions of the plant that were, in some cases, covered up, took no benefit, and the disease continued its ravages. Precisely the same effect was produced on potatoes that were affected. The lime was sifted on them while the dew was on them, and all the upper surface got well sprinkled. In most cases, the heart of the plant and the stems received upon the surfaces the powdered lime. A large portion of the crop—indeed, wherever the lime absolutely touched the surface of the stems and foliage, almost instantly dried up as far as the disease went; and we have no doubt that, had it been followed well up, day after day, until all had been sprinkled where they were affected, the effect would have been the same throughout. The crop turned out well, with the exception of those plants which had not been properly sprinkled, and they continued the disease down to the lower part of the stem; but very few were touched, and we took the precaution to place all the potatoes that came from plants still diseased by themselves, that they might be used first. Lime soaked, or rather slaked in water, is efficacious in all possible ways for destruction of insect life. The syringe applied with it to trees infested with caterpillars, soon clears it altogether. Sprinkled on grass lawns, which it whitens till the rain washes it off, it drives the worms down, or brings them to the surface very quickly. Syringing plants which have the bug, or wall fruit trees, (that are sometimes covered with ants, ear-wigs, small caterpillars,) and afterwards with clean water, is of great service; and lime dusted, or lime-water sprinkled, on gooseberry and currant-trees, cleans them as completely as if they had never been attacked. Laid round a bed liable to the attacks of

wandering snails and slugs, it prevents them from crossing the boundary; but it requires renewal, because its caustic qualities are lost in time. Ploughed into land, or forked into beds infested with grubs, it has the best possible effect; and where the garden is bounded by a hedge, which is the most harbouring of all receptacles for vermin, there is no better means of destroying the greater part of them than sousing it well with lime-water, by means of the garden-engine. There can be no mistake in lime-water, for this purpose; because you may let the water take up as much lime as it can, only it must be used clear. Lime is one of the best substances to mix with manures of all sorts: it absorbs that which would be wasted; it disinfects the mass, it makes the most offensive matter inoffensive. A layer of night-soil, and a layer of lime, would be as harmless as so much common earth. It is impossible, therefore, to overrate the usefulness of this substance, in the garden or in the farm; and the more the public begin to understand the value of the sewerage of the metropolis, the contents of cesspools and drains, the more will they also recognise the value of that substance which will render the most nauseous of all waste harmless, and prepare it for the earth which requires it. Lime is of such efficacy in the way of disinfecting any disagreeable production, and counteracting infection in every shape, that one of the most early precautions against the approach of contagious disease, is to lime-wash the brick-walls of all work-houses and public buildings where the lower orders congregate. It is even said that the brick-walls of the chief apartments in union-houses, is not covered with plaster, or other matter, because they should take the lime-white readily; and this hint may not be lost on those who house and provide for many work-people during the summer season. Lime-white the walls, and use lime to disinfect any thing that might become a nuisance.

THE CHOROZEMA.

THIS is one of the prettiest families that occupy the greenhouse, and, if we judge from the public exhibitions, one of the worst used. Like the cultivators of the *Hovea*, another ill-treated family, the cultivators of the *Chorozema* seem to fancy they have nothing to do but grow them as fast as possible; and so, instead of producing compact, shrubby, well-furnished plants, capable of supporting themselves, they bring loose, wiry, weakly assemblages of rapidly-grown branches, necessarily supported by numerous stakes, the leaves few and far between, and the whole affair exhibit-

ing nothing but proofs of unnaturally-excited growth, with a prospect—nay, a certainty—of premature decay. All the miserable mismanagement may be attributed to that morbid appetite for rapid increase of size, brought about by that worst of all mistakes committed by a peculiar clique of public writers, who for a time took immense pains to show that quick growth is a proof of skill, and thus operated on a set of vain, inexperienced gardeners, who set to work with the one single object in view,—the growing of plants rapidly. What a falling off, however, has there been in the collections so mismanaged! A fortune would not replace the losses in some great collections; and nothing could compensate for the mortification which the owners have suffered at the destruction of plants that nothing could replace. Gardeners who had been praised in the public prints for extraordinary skill in the production of so-called splendid specimens—that is to say, specimens grown altogether out of character, and propped up and out in all directions by wires and sticks—have been discharged without ceremony, and found great difficulty in obtaining other situations; while others have been taken, to see the sad fate of other excited plants, and to bear the blame that belonged to their predecessors, whose greatest fault was that of being betrayed, by a theorist, into a new and destructive practice. Gardeners of the old school, whose fate it was to be ridiculed by the advocates of the progressists, for loitering on the road to science, have lived to see those who were going so fast, humbled, defeated, betrayed and degraded, falling behind the loiterers, who, with collections unimpaired, and characters unimpeached, maintain their proper places. But to our subject. We say, without fear of contradiction, that plants ought not to be unnaturally excited; and that nine-tenths of the serious and irremediable losses that have been sustained by our most spirited collectors, have been caused by growing the plants too fast. We have seen the downfall of many who sneered at their less ambitious brethren; and some of the writers who presumed to teach us how to grow *fuchsias*, and how to proceed on the one-shift system, have not only fallen into contempt through their own ultimate failure, but their names have become bywords for describing any very gross mismanagement. The *Chorozema* presents us with several very pretty and distinct characters. They are all very abundant flowerers, mostly composed of different shades of yellow, orange, brown, and almost red. *Chorozema Henchmanni* is dull red, and unlike any other of the family. *C. rhombeum* is a pretty half-climbing, or pendant plant, which, well-trained, is a beautiful object. *C. varium* is

one with a holly-shaped leaf, but well named *varium*, as regards the foliage, as, in a score of seedlings, scarcely two will be alike; and *C. ilicifolium* has a small prickly leaf, very like holly, but very much smaller. All the tribe are worth growing, and, if allowed to grow naturally, are beautiful. The proper soil to grow them in is—turfy peat, rubbed through a very coarse sieve, two parts, rich loam from a pasture, one part. These should be well mixed; and if the turfy peat be good, and contains, as is usual, a good deal of sand, the water will run through this mixture very freely. If, however, this should not be the case, a little sand may be added. Obtain the plants as small as possible after they are struck, and pot them in this soil, in a pot just large enough to hold the roots and a trifling thickness of soil beyond. If the plant is ugly, train it into some kind of shape before you set it growing. *C. rhombeum* will be wiry, and tied up to a stick; and the best way to grow this is to have the supporter a foot long, continue to tie the longest stems loosely up the stick, and when they grow beyond the top, let them hang down, for the plant will form a very pretty head, and throw out the ends of its branches weeping like a willow all round, and reaching two-thirds down towards the pot. It will be seen, that some taste may be used in the regulation of these drooping branches. All the sorts require great attention in the watering. The drainage must be particularly good, for stagnant water in the pot would destroy the plants soon. Examine the pots from time to time, that they may be shifted to larger pots before the roots get matted, though they should begin to grow round the outside of the ball pretty freely before they are removed from one sized pot to another. They cannot have too much air, nor too much light. When they require shifting, get a size larger pot, put some crocks at the bottom, and on them a little soil; turn out the ball of earth whole. You need not remove the old crocks from the ball of earth; but if they fall away of themselves, throw out everything from the new pot, and fill it one-third full of crocks. Then put some soil up like a cone, in the new pot, and place the ball very gently on this cone of soil, because, with a slight pressure, you can press it down till the collar of the plant is just even with the edge of the new pot. Now fill up carefully the space all round the ball, pressing it gently down all round with a piece of stick thin enough to go down without bruising the fibres, which would greatly injure and retard the plant. Great care must be taken that the plant does not get placed a shade lower in the soil than it was; indeed, it had better be higher than lower, for to lower it is fatal. You

will not find your plants grow quite so rapidly as your neighbours', perhaps, but they will grow handsomer, and more compact; the foliage will be of a good colour. If there is the least inclination to get lanky in any of the branches, except always the *C. rhombeum*, pinch off the end; for as the object is to get a shrubby, compact form, no vigorous branch must be allowed to run away with the strength that should go to the whole plant. Thus should you keep on with this group of plants, shifting as they require it, watering occasionally, that they may not be in want of regular nourishment. In this way will the whole tribe of the Chorozeas flower every season, and make fresh growth after blooming, increasing moderately in size from year to year, but being always handsome, whatever be their size.

PROPAGATING FROM CUTTINGS.

Nothing strikes much more freely, with proper attention, than all these species. The cuttings may be taken about two inches long, from the ends of shoots, when the plants have made their growth after flowering. These should be cut off at a joint, and the lower leaves for three quarters of an inch stripped off. These may be inserted in soil similar to the stuff they grow in, as far down as the leaves are off; and after being watered in, they may be covered with a bell-glass that will come within the pot, so as to press the edge down in the soil, and exclude the air. The pot should be placed in the propagating-house; the inside of the glass should be wiped dry every morning, and a proper shade should be so placed over the glass as to keep off the violent rays of the sun. When these cuttings have rooted, they should be potted off singly into small sized sixty pots, with a bit of moss for drainage. After watering them, to settle the soil about their roots, place them in the propagating-house again for two or three days to establish them, when they may be removed to the greenhouse, to undergo the treatment which we have already described.

RAISING FROM SEED.

The different species of *Chorozema* seed freely when in good health, and the best time for sowing it is directly it is gathered. It should be sown in a wide-mouthed pot, for the sake of a good body of soil, which keeps moist longer without water than any shallow pans or boxes will. When sown, and lightly covered with soil, a hand-glass should be placed over it, and it ought never to be permitted to get dry afterwards. If this pot be placed in the propagating-house, or a very slight hot-bed, the seeds will the sooner vegetate. When they are up, they must be

allowed sufficient moisture and air, and may be removed to the most sheltered part of the greenhouse,—that is to say, the place most free from draughts; for though they want air, they would take hurt within the draught of any cutting wind, until they become a little established. As soon as they are large enough, they may be potted into sixty-sized pots, three or four in a pot, and placed next to the side of the pot; and here they may continue to grow, until large enough to place in small-sized sixty pots, one in each pot; after which their treatment must be the same as that of small plants, as already described.

THE PERFECTION OF THE FUCHSIA.

THE form of the Fuchsia, which we settled long before any other writer thought of it, has been, like all the rest of the properties of flowers, disputed by those who had *some of all forms but the right*, and especially by those who fancied they had something very superior to others. The globe form is far the best, for the undeveloped blooms hanging like so many cherries, are in all stages beautiful; but to be perfect, the sepals should, when fully blown, reflex into a globe again, displaying the inside of the sepals, (which is by far the most beautiful



surface, both in texture and colour, completely hiding the tube or base of the flower, and exposing the corolla, which is a most important feature. It is not our purpose here to defend those points which common sense recognises as excellences, such as the contrast between the sepals

and corolla, and other self-evident qualities, but simply to exemplify the perfection which, we admit, has not been attained, and is, comparatively, little understood; and to show that, as the object, independent of form, is to show the inner surface of the sepals instead of the outer, and to expose to view the whole of the corolla, that which reflexes a little is better than that which does not reflex at all; and that, among those that do not reflex, the

more they expand the better they are, because the more corolla they show. It requires but little observation to discover all the approaches to excellence; and the more points a flower possesses of those considered

good, the nearer it approaches to that perfection, which *may* never be fully attained, but which will be, if it has not already been, pretty nearly achieved. Our engravings are, first, the perfect bud just opening; the other is the perfect bloom fully developed, with the sepals completely reversed.—G. G.

NEW FLOWERS AND PLANTS.

METROSIDEROS ROBUSTA, *Allan Cunningham* (robust *Metrosideros*).—*Myrtaceæ* § *Lep-tospermæ*.—A fine-looking evergreen bush, well deserving its specific name, in consequence of its robust appearance. The branches are vigorous, and often branch in a forked manner. The leaves are opposite, flat, and of an oval figure, having a rich aromatic odour. The flowers grow in small clusters, and consist of long crimson stamens, surrounding a cup-shaped green wavy disk; they are scentless. Mr. Cunningham states that it forms a large high tree, with hard close-grained durable wood; under cultivation, however, it flowers freely when not more than a yard high. Native of New Zealand. Introduced by J. C. Bidwill, Esq. in 1845. Flowers in June. It is called *Katu* by the New Zealanders, and bears the name of *Myrtus robusta* in some gardens. *Culture*.—Requires a greenhouse; peat and loam; propagated by cuttings planted in sand, under a bell-glass.

NEMOPHILA MACULATA, *Bentham* (spotted-flowered *Nemophila*).—*Hydrophyllacæ*.—A very pretty, and highly interesting annual plant, closely related to the now common favourite *N. insignis*, but altogether different in colour. It is a dwarf decumbent plant, of spreading habit, having pinnatifidly lyrate leaves, and whitish flowers; remarkable from having a large violet-coloured blotch just at the tip of each lobe of the corolla. The colours, however, vary, and hence the plant will have to be very carefully selected for seeding, to keep to its true character; sometimes the blotches are ill-defined and faint, and sometimes the veins of the lobes are of a pale blue, which spoils the purity of the blossoms. Native of California. Introduced by Mr. Hartweg in 1848. Flowers in summer. Mr. Hartweg gave it the objectionable name of *N. speciosa*. *Culture*.—Hardy, or nearly so; requires to be sown in the open border, or in pots for transplanting; common light soil; propagated by seeds.

IMPATIENS REPENS, *Moon* (creeping Balsam).—*Balsaminacæ*.—Sir W. Hooker calls this "the finest of all the yellow-flowered balsams" at present known to him. It is a straggling, procumbent, copiously branched plant, the



branches rooting where they touch the ground, and furnished with small, glabrous, subreniform, heart-shaped green leaves, attached by red footstalks. The flowers are axillary and yellow, of large size, and produced freely over the plants, which grow to a considerable size, as compared with the slender habit and small foliage. It is supposed to be, strictly speaking, an annual, though preserved without difficulty by means of cuttings. Native of Ceylon, in elevated Alpine tracts. Introduced to Kew by Mr. Gardner, about 1847. Flowers during the summer months. *Culture*.—Requires a stove, or probably succeeding best during summer in a greenhouse; rich vegetable soil; propagated most readily by cuttings of the young shoots.

ACHIMENES CANDIDA, *Lindley* (white-flowered *Achimenes*).—*Gesneraceæ* § *Gesneraceæ*.—A neat looking species, a little too leafy, but producing lively-looking white blossoms, which afford a good contrast with the colours of the other species. It has a scaly tuber, and round, upright, slightly hairy stems, growing a foot or a foot and a half high, and producing opposite, oblong, deeply serrated, hairy leaves, oblique at their base, and from their axils, clusters of—usually—three blossoms, of which the central one first expands, and subsequently the other two. The leaves are about four inches long, and the blossoms half an inch long, with a yellowish tube, and a white, flat, oblique limb divided into five lobes, down the centre of each of which a line of purple dots is placed, becoming more numerous, and less regular, within the tube. Native of Guatemala. Introduced by G. W. Skinner, Esq. in 1848, to the garden of the Horticultural Society. Flowers in summer. *Culture*.—Requires a stove, or to be raised in heat in spring, and flowered in a warm greenhouse; light vegetable soil; propagated by means of the scaly tubers.

HOYA BELLA, *Hooker* (beautiful *Hoya*).—*Asclepiadaceæ* § *Stapelieæ*.—A most charming plant, of suffruticose structure, and a diffuse habit of growth, though hardly such as would be called climbing. The branches are copiously furnished with small fleshy leaves about as large as, and of the shape of, those of the broad-leaved myrtle; they are dark green, and arranged in an opposite manner. The flowers grow in umbels of eight or ten together, produced laterally at intervals along the shoots; they consist of a rotate corolla, lobed with five obtusely-angular points, of a white colour, and a coronet of five somewhat boat-shaped deep-purple divisions; these “resemble an amethyst set in frosted silver,” so exquisitely delicate is their texture; they are, moreover, deliciously scented. Native of Moulmein. Introduced by Messrs. Veitch

in 1847. Flowers in June and July. *Culture*.—Requires a stove; light turfy and vegetable soil; thrives best grown as an epiphyte, for which its habit well adapts it; propagated by cuttings in moist heat.

LUPINUS AFFINIS, *Agardh* (related *Lupin*).—*Fabaceæ* § *Papilionaceæ*—*Genistaceæ*.—A dwarf annual species, related to the very pretty *L. nanus*, attaining from six inches to a foot in height, but slightly branched, and the stems covered with silky hairs. The leaves are composed of from five to seven fleshy linear obovate blunt leaflets, silky on the underside; and the flowers grow in short irregular whorled racemes, and are of a bright deep blue, with a broad white blotch in the middle of the upper segment. It is an abundant bloomer, and lasts a long time in flower. Native of woods near Monterey. Introduced by Mr. Hartweg in 1848. Flowers in the summer. *Culture*.—Hardy; good garden soil; propagated by seeds.

GASTROMENA SANGUINEUM, *Lindley* (blood-red *Gastronema*).—*Amarylhidaceæ* § *Amarylhidaceæ*.—A very handsome bulbous plant of the smaller class, growing not more than eight or ten inches high, half which height consists of a hollow glaucous stem supporting the solitary flower. The leaves are about as tall as the flower, slightly glaucous, and linear-spathulate in figure. At the base of the flowers is situate a pair of long narrow spathes. The tube of the flower “is slender and greenish, and expands into a deep rose obconical throat, having six crimson lines running from the sinuses of the limb on the outside, and on the inside as many white bands, each with a crimson streak along the middle; the limb is very deep rose-colour, with six equal spreading oblong whole-coloured segments,” forming a blossom fully three inches across. Native of Caffraria. Introduced in 1845 by Messrs. Backhouse of York. Flowers in August. *Culture*.—Requires a greenhouse; rich sandy loam; propagated by offsets.

MONARDELLA UNDULATA, *Bentham* (wavy-leaved *Monardella*).—*Lamiaceæ* § *Satureæ*—*Organidæ*.—A small free-growing annual plant, with erect purple stems nine inches high, and but slightly branched; the leaves are linear-oblong, blunt and wavy, and of a dull grey colour; and the flowers grow in stalked terminal heads, and are of a bright violet colour and very durable. The whole plant is said to emit a powerful and rather agreeable odour. Native of Monterey, growing in fields. Introduced by Mr. Hartweg in 1848. Flowers in June and July. *Culture*.—Hardy; good garden soil; propagated by seeds.

RESTREPIA VITTATA, *Lindley* (spotted *Res-*

trepia).—*Orchidaceæ* § *Malaxæ-Pleurothal-lidæ*.—A small growing epiphyte, having a short stem three inches high, supporting one long obtuse leathery leaf, at the base of which springs a little erect stalk about half its length, bearing one blossom, the sepals of which are white, the petals spotted with deep rose, and the lip dull yellow striped with deep rose. Native of Colombia. Introduced in 1847. Flowers in July. *Culture*.—Requires a stove; turfy peat soil, or to be grown on a block of wood; propagated by division of the plant.

NAVARRETIA ATRACTYLOIDES, *Hooker and Arnott* (atratylis-like *Navarretia*).—*Polemoniaceæ*.—A small uninteresting annual, growing about six inches high, with purple wavy stems covered with viscid glandular hairs which give the plant an unpleasant foxy odour. The leaves are ovate, pinnatifid, with stiff spiny segments; and the flowers grow in nearly sessile heads, and are of a pale lilac colour, or sometimes white, small and inconspicuous. Native of fields near Monterey. Introduced in 1848 by Mr. Hartweg. Flowers in July. *Culture*.—Hardy; common soil; propagated by seeds.

VALERIANA MIKANIE, *Lindley* (mikanialike *Valerian*).—*Valerianaceæ*.—An inconspicuous flowered half-shrubby climbing plant, with smooth terete entangled stems, smooth cordate leaves coarsely serrated, and large entangled panicles of very minute white blossoms the tubular part of which is swollen, and the five-cleft limb revolute. It is a free grower, but quite unornamental. The leaves when bruised are said to have the odour of "pease-cods." Native of Guatemala, having been raised from the rubbish received among some orchids from that country in 1847. Flowers in summer and autumn. *Culture*.—Requires a warm greenhouse; rich loamy soil; propagated by cuttings or by seeds.

ACHIMENES ATROSANGUINEA, *Lindley* (dark red-flowered *Achimenes*).—*Gesneraceæ* § *Gesneræ*.—One of the handsomest of the species of this favourite genus. It has scaly tubers, upright pubescent stems two feet high, and oblong subcordate, deeply toothed hairy leaves. The blossoms are beautiful, consisting of a slender tube an inch and a half long, yellow and spotted with deep purple, and a small spreading limb of five subrotund segments of a vivid scarlet colour. The native country of this species is not stated, but it is probably Guatemala. Introduced about 1847, and communicated by Messrs. Knight and Perry to the Horticultural Society. Flowers in summer. *Culture*.—Requires a stove, or to be raised in heat in spring, and flowered in a warm greenhouse; light vegetable soil; propagated by means of the scaly tubers.

ACHIMENES MISERA, *Lindley* (miserable *Achimenes*).—*Gesneraceæ* § *Gesneræ*.—A mere weed. It is a small tuberous rooted perennial, pubescent in every part, and having opposite oblong deeply serrated leaves, and small dingy whitish flowers speckled with purple in the inside, of no interest whatever. Native of Guatemala. Introduced in 1848. Flowers in August. *Culture*.—Requires a stove, or to be raised in heat in spring and flowered in a warm greenhouse; light vegetable soil; propagated by means of the scaly tubers.

ROSA RUGOSA, *var. plena purpurea* (double purple rugose Rose).—*Rosaceæ* § *Rosidæ*.—A hardy half-climbing rose, resembling the *Rosa bracteata* in habit. The leaves are shining on the upper surface, and underneath covered with pale whitish scentless glands. The flowers are semi-double, sweet-scented, and of a rich deep purple colour; and about two inches across. Native of China. Introduced in 1846. Flowers from June to August. *Culture*.—Hardy; good loamy soil; propagated by cuttings planted in a slight heat.

CLEMATIS INDIVISA, *var. lobata* (lobed variety of the undivided-leaved *Clematis*).—*Ranunculaceæ* § *Clematæ*.—A very ornamental climbing plant, with long branches, opposite ternate leaves, the ovate coriaceous leaflets of which are lobed (in which respect only it differs from the species *C. indivisa*), and large copious axillary panicles of white flowers; the panicles are often a foot long. The blossoms are diœcious and consist of from five to seven large spreading oblong silky segments. The bases of the stalks of the opposite leaves are connate, that is to say, they meet, and are continued as it were quite round the stem. Native of New Zealand. Introduced about 1846. Flowers in April. *C. indivisa* is also the *C. integrifolia* of Forster, but not of Linneus. *Culture*.—Requires a greenhouse; rich light loamy soil; propagated by cuttings or by seeds.

IXORA LANCEOLARIA, *Colebrooks* (lance-leaved *Ixora*).—*Cinchonaceæ* § *Coffææ-Psychotridæ*.—An evergreen shrub, attaining the height of seven feet or more, with erect slender dichotomous branches, lanceolate acuminate leaves often a span long, and terminal trichotomously divided corymbs of rather lax greenish flowers; the tube of the corolla slender, and three quarters of an inch long, the limb of four spreading linear-oblong lobes, which are at length reflexed. A young branch not unfrequently springs up on each side the head of flowers. Native of the East Indies, at Travancore and Courtallam. Introduced in 1846. Flowers in April. *Culture*.—Requires a stove; turfy peat soil; propagated by cuttings planted in sand, under bell-glasses in heat.

HIBISCUS FEROX, *Hooker* (stinging Hibiscus).—Malvaceæ § Hibisceæ.—A very distinct but not showy plant, of strong coarse habit, and furnished in every part with irritating spines. It is a tall shrub, of upright habit, furnished with stout succulent branches often deeply tinged with red purple, and more or less clothed, as is every part exterior to the corolla, with hairs and small spines, the latter seated on a tubercle and not unfrequently tipped with red. The leaves are large, roundish, cordate, five or seven lobed, margined with coarse sharply spinulose teeth. The flowers grow two together from the axils, and consist of a reddish pentagonal tubular calyx two inches long, and a tawny-yellow corolla of five spatulate twisted petals, the whole surrounded at the base by an involucre of ten spreading lanceolate-acuminate leaflets. Native of New Grenada, near Iratcho. Introduced in 1844. Flowers in May. *Culture*.—Requires a stove; rich loamy soil; propagated by cuttings or by seeds.

SIPHOCAMPYLUS MANETTIAEFLORUS, *Hooker* (manettia-flowered Siphocampylus).—Lobeliaceæ § Lobelex.—A very pretty sub-shrubby plant, dwarf, neat and compact in its habit, attaining about a foot in height, and remaining almost constantly in flower. The numerous branches are clothed with alternate nearly sessile reticulated glossy leaves, oblong-ovate, two inches long, and obscurely serrated. The flowers are borne in the axils of the leaves, and are tubular, irregularly five-cleft at the end, where they are yellow, the rest (two-thirds) of the flower being a bright scarlet red. Native (probably) of New Grenada. Introduced about 1846. Flowers almost constantly. It is called in gardens *S. nitidus*; the paragraph at p. 425 under this head, refers partly to the same plant, and should be cancelled. *Culture*.—Requires a stove; turfy peat and loam with sand; propagated by cuttings, planted in sand, and placed in a gentle heat.

overlooked among the crowd of novelties which, in the last quarter of a century, have found admission to our gardens. We hope soon to see them more prominent under cultivation—both introduced to rock gardens, and the *Cistus* also to the front rank of shrubberies, and the *Helianthemums* to the miscellaneous flower borders.

As a wild flower the species now represented is somewhat rare, being found only in



one or two places in the south-west of England. It forms a procumbent shrubby plant, with numerous much-branched stems, which are hoary, with short close-pressed stellate down, and furnished with opposite ovate-oblong, or linear-oblong leaves, which are greenish above, and covered with close-pressed down, but most so on the under side, where they are hoary, almost white; the margins are more or less reflexed. The flowers, which are numerous produced, are borne in racemes at the ends of the stronger branches; they are large, an inch and a half across, white, with a tinge of yellow about the centre. The blossom is constructed of five roundish wedge-shaped petals, set around a central cluster of numerous stamens. The flowering season is from June to August.

The plant under notice is the *Cistus polifolius* (Linnaeus), but not the *Helianthemum polifolium* (De Candolle): it is De Candolle's *H. apenninum*.

Either planted about a piece of rock-work, dotted here and there in the flower-borders, or placed by itself in a small bed surrounded by grass, this species is a very showy and desirable plant. The adaptability of the *Helianthemums* to rock-work is pretty generally known; several of them require, however, slight winter protection, and where any quan-

BRITISH WILD FLOWERS.

THE HELIANTHEMUM POLIFOLIUM.

Helianthemum polifolium, Arnott (white mountain Sun Rose).—Cistaceæ.

The showy families of Rock Roses and Sun Roses, the *Cistus* and *Helianthemum* of systematic botany, may almost be classed amongst neglected plants. Formerly they seem to have elicited more attention—witness the beautiful work, *Sweet's Cistineæ*, published by Robert Sweet, and devoted entirely to their representation and elucidation. They have not been passed by for lack of merit, but being of humble stature they have been

tity are grown it is perhaps most convenient to subject all to similar treatment, and thus it is usual to keep a stock of potted plants through the winter in frames. We would strongly recommend a selection of a few of the most distinct and showy colours, to be planted each in a small separate bed on grass, after the same manner as parterres are arranged, *en masse*. About half-a-dozen distinct colours might be selected, and half-a-dozen beds filled entirely with these: each bed being planted with one kind only, would keep up a display from the month of May quite through the summer. The beds should be formed of well-drained sandy loam; and hardy varieties should, as far as possible, be selected, so that they might be permanent, as young plants kept under cover during winter would not perhaps flower so finely nor so early as those which were established. Cuttings from these should, however, be struck annually, and preserved in frames through the winter, in case very severe frosts should destroy the out-door plants.

NEW GRAPES.

THE following recently proved new varieties of Grapes are described in the *Journal of the Horticultural Society*:—

Sahibee. This is a Deccan grape, and was sent by Colonel Sykes to the Horticultural Society. Its fruit ripens early, and the vine bursts soon into leaf, so that it may prove eligible for very early forcing. Bunches large, handsome, tapering, sometimes slightly shouldered. Berries large, oval, tinged with rose on the exposed side; pulp tender, juicy, sweet and pleasant, not musky, nor equal in richness to the Sweetwater.

Olver. Sent to the Horticultural Society by Messrs. Baumann of Bollwyller as a wine grape. Resembles the Royal Muscadine, but ripens rather later. Independent of its qualities as a wine grape, it is deserving of cultivation. Bunches rather larger than those of the Royal Muscadine, with stiff shoulders. Berries round, white, larger than those of the kind just named, on short thick pedicels; pulp juicy and vinous, but hardly so sugary as the Royal Muscadine.

Reeve's Muscadine. From the Cape of Good Hope, whence it was imported by J. Reeves, Esq. It is a good grape, ripening quite as early as the Black Hamburgh, and is deserving of cultivation. Bunches large, with broad shoulders and thick stalks. Berries oval, on short stiff pedicels, yellowish-white with a rather thick skin; pulp melting, rich and juicy.

Gros Gromier du Cantal. Obtained from

Paris. A strong growing variety, appearing like a cross between the Black Hamburgh and the White Sweetwater. The leaves are deeply serrated, and occasionally deeply lobed. Bunches large, with strong stalks. Berries large (upwards of three inches in circumference), round, red or grizzly in colour; pulp juicy, in flavour intermediate between the two kinds named above, partaking of both.

Blussard Noir. Sent to the Horticultural Society by Messrs. Baumann. It is a smaller, earlier, and more sugary variety than the Black Hamburgh, which in other respects it resembles.

Verdal. An early ripening variety of good quality. The fruit resembles that of the Royal Muscadine, to which in point of flavour it is fully equal. The leaves resemble those of the White Frontignan.

Nice Black Cluster. Raised by J. Williams, Esq. of Pitmaston, from the White Nice, fertilized with the small Black Cluster, the object being to obtain a hardy grape for south walls. In a good season it becomes perfectly sweet on a south wall by the middle of September. Bunches large (from a vinery, nearly a foot in length), with loose shoulders. Berries small, roundish or roundish-oval, on long pedicels, black; juice sugary, tinged with purple.

Williams's Seedling White Grape. This was also raised by J. Williams, Esq. from the White Muscadine, fertilized by the White Muscat of Alexandria. It hangs long, and is a good imitation of a Frontignan, deserving further trial; a great bearer, the smallest shoots bringing two bunches and perfecting them. Bunches small. Berries round, white, juicy, with a slight Muscat flavour. The great recommendation of this variety, according to Mr. Williams's experience, is, that the berries never shrivel.

Black Prince Hamburgh. Another seedling raised by J. Williams, Esq. from the Black Hamburgh, fertilized by the Black Prince, the object being to obtain a loose open bunch, with the vinous acidity and richness of the latter variety. It is useful, and deserves to be propagated, as it ripens earlier than the Hamburgh, and colours with less heat and light. Bunches loose, with long shoulders. Berries oval, on long, rather slender pedicels, about nine-tenths of an inch in diameter from the stalk to the opposite end, and eight-tenths in the transverse direction; blue-black; juice more purple than the Hamburgh, sugary, and rich.

THE CULTIVATION OF MUSHROOMS.

I COLLECT pure cow-dung, not fresh, but such as I happen to find in the park, the fields, or the farm-yard; with this I mix the scrapings of roads, in the proportion of one-half to one, adding to it about one-third or one-fourth of vegetable mould, obtained from leaves or decayed sticks. These ingredients being well worked up together, the compost is formed into bricks about nine inches long, three and a half broad, and two thick. The bricks are exposed to the air and sun, and suffered to attain such a degree of solidity as to bear a considerable pressure, but not to dry hard. They are then removed to a shed for the purpose of being laid up in *strata*. Three or four rows are first placed on the ground, with interstices of about one inch in width between the rows and the bricks; into these interstices, or spaces, loose spawn, such as is found in the litter of old mushroom beds, is scattered; and over the whole surface of the layer such spawny litter is likewise spread. Should there be no old mushroom beds at hand to furnish the scatterings, some spawn bricks must be broken to pieces in order to supply them. The first layer having been thus treated, another is put upon it, and likewise interspersed and covered with spawn and litter from old beds. A third and fourth stratum may be laid on, or more, and regulated in the same manner. The whole pile being completed according to the quantity that is required, it is covered over with hot stable dung, and litter; and in two, three, or more weeks, according to the state of the weather, the bricks are filled with spawn, and may be laid by for use. I will not hazard an opinion, whether the cow-dung itself contains the elements of spawn, or only acts the part of a *matrix*, or receptacle; but this I can state, that mushroom spawn is generated in other dung besides horse-dung; for I once found it plentifully in pigeon's-dung. As I have used this preparation of spawn for a length of time, the essence of cow-dung must entirely preponderate in my composition; though the origin of the spawn should at first have been derived from horse-dung. I may add, that, when managed in the manner I have described, it yields spawn as productive as any that can be obtained. I was formerly taught to believe that it was essential to mix a portion of horse-dung in the bricks, but my experience has since convinced me that cow-dung alone answers the purpose. The spawn is generated in it plentifully and of good quality. It is of importance that the bricks alluded to should not be left in a situation which would cause the spawn to work, an effect which would be produced by moisture com-

bined with warmth. Therefore, when the spawn is bred, the bricks must be laid in a dry place to prevent the process of germination. The spawn must not be suffered to advance towards the rudiments of the mushroom, which consist in little threads or fibres, for in this state it ceases to be useful in spawning a bed. As soon as those rudiments are formed, they must be left undisturbed, or they perish. They will grow into a mushroom on the spot where they are developed; but when removed or torn up, they are destroyed. A piece of spawn which appears in filaments or fibres, is no longer applicable to a mushroom-bed; it may produce a mushroom in itself, but can serve no other purpose. The spawn that is to be inserted in a bed, and to receive its development there, must not be gone so far; but should only have the appearance of indistinct white mould.

The spawn being duly prepared, the beds are next to be considered. I have generally made them in a shed, against the wall, sloping from the wall downwards; about two feet high at the back, and perhaps a little less than one foot in front. The materials for the bed are horse-dung mixed with litter, such as is commonly used for hot-beds; dry leaves may be added, or the greater part, if not the entire bed, may consist of leaves. I do not employ the dung fresh, but after it has lain on a dunghill, and has been frequently turned and well worked. There must be no rank heat in it, for the spawn would be killed by an excess of warmth. The temperature of the bed should be between 50° and 60°. From 52° to 55° may be quite sufficient. When the temperature is reduced to a proper state, the spawn is inserted. If the bed happens to be dry, I put a layer of moist manure, of the same quality from the dunghill, upon the spawn; or if, on the other hand, the bed be too moist, I put a layer of drier manure over it; these layers I make about two inches thick. The mode of spawning is the usual one; namely, the bricks are broken into small pieces, which are inserted at three or four inches' distance from one another. The beds are earthed over about one inch and a half thick, and ultimately covered with hay of different thickness, according to the state of the season. I have never made use of fire-heat; but always succeeded in regulating the temperature of my beds by means of covering. I scarcely ever have occasion to water the beds, owing to the materials of which they are composed. There is no doubt that their quality depends upon the manner in which they are nourished: if they are meagerly fed, their flavour and substance will be poor in proportion.—*Mr. T. Rogers, in Horticultural Proceedings, 1821.*



NEMOPHILA MACULATA.

NEMOPHILA MACULATA, *Bentham* (spotted-flowered *Nemophila*).—Hydrophyllaceæ.

This is said to be the best of the annual plants collected by Mr. Hartweg, during his recent mission to California in search of new plants for the Horticultural Society. Mr. Hartweg gave it the name of *N. speciosa*, a title which has been rejected on account of its "inappropriateness," and Mr. Bentham has given it that which stands at the head of this article, but which is not, by the way, a very distinctive one, inasmuch as one of the commonly cultivated species *N. atomaria* has its flowers spotted all over with little dark-coloured dots.

Nemophila maculata is an annual plant, of a procumbent habit, like that of the well-known *N. insignis*, and the whole plant is clothed with short spreading hairs. The lower leaves are lyrate-pinnatifid, the lobes being short, obtuse, and somewhat falcate, and the upper ones wedge-shaped and three-lobed. The flowers grow from the axils singly, on stalks longer than the leaves, and are about the size of those of the large variety of *N. insignis*, whitish in their ground colour, and each lobe of the corolla tipped with a large deep-violet blotch, which, when perfect, gives the flower a showy and rather peculiar ap-

pearance. This plant attains about the same size as does its congener just mentioned, and produces its blossoms freely, so that it will prove both useful and ornamental under cultivation.

There is one circumstance which has been observed respecting it, that may be regarded as an objection; the colours are liable to sport and vary. Sometimes the flowers are veined, the veins being of a pale blue colour, thus spoiling their purity; at other times the spots are ill-defined, pale, and even sometimes run, by which the flowers lose their distinctness. To retain the species, therefore, in its beauty, the seeds must be saved from the more perfect only of the blossoms, or those in which the colours are pure and distinct; and from among these, those with indistinct, pale, or run colours, should as far as possible be removed as soon as they show themselves. It is the clear and deep-coloured well-defined spotting which gives to the true kind its beauty; the indistinctly marked plants being in every way inferior.

No difficulty occurs in its cultivation, which should be made to accord with that of the other species, which are by this time familiar objects in most gardens. As an annual it will rank in the hardy class, growing well in any

good garden soil, and perfecting seeds by which it may be continued from year to year. These seeds may be sown either in the open border, at different periods for a succession of blooming plants, or the earlier plants may be reared in pots or boxes in a frame, and transplanted into the open ground in April or May. Whether it would survive the winter if sown in the autumn, as *N. insignis* does in dry warm situations, we have had no opportunity of

knowing; but coming from the same country, California, the probability is that it would, and if so, a portion should be sown in this way for blooming early in the spring.

Though an interesting, and when perfectly true, a pretty plant, it is by no means so ornamental or effective as *N. insignis*, owing to the absence of distinctive colouring, which in the latter species, apart from its other beauties, renders it a particular and universal favourite.

THE MANAGEMENT OF GREENHOUSES.

ONE of the principal points to look after in the commencement of a greenhouse management, is to provide near it a room or shed in which all the littering business, such as potting, cutting down, pruning, shifting, and other dirty work may be done. In this there should be a strong table, a bin with several partitions, in which particular composts should be separately kept; these to be filled with—

1. Peat rubbed through a very coarse sieve.
2. Loam from rotted turfs.
3. Potsherds, or broken flower pots of two or three sizes, kept separate.
4. Leaf-mould, being leaves that have rotted into mould.
5. Dung from a melon or cucumber-bed rotted to mould.
6. Silver sand, or very clean river sand.
7. Cow-dung rotted into mould.
8. Turfy peat, merely chopped into small pieces, of say half-an-inch to an inch square or solid.
9. Loam from the top spit of a pasture, without the turf.
10. Horse droppings rotted into mould.

But if there be not convenience for all this, or they cannot be got at, peat (No. 1), loam (No. 2), potsherds (No. 3), and dung (No. 5), are absolutely necessary, and could be made shift with. Then there should be trowels; short blunt-ended sticks of different sizes, to poke down the soil round a plant when shifted from one sized pot to another; scoops like a coal-scoop, to take up the different soils, and by which the pots may be measured as they are taken; sticks of all lengths for supports to plants in pots; flower pots of various sizes, from those called *sixties* to the largest, called *ones*. These sizes comprise wide-mouthed and uprights, between which there is very little difference in the quantity of mould they will contain, but one is formed with nearly straight sides, the other wide at the top and tapering at the bottom, and of course there is a difference in the diameter across the top; there is also a different form, and a slight difference in the measure between one pottery and another. However, as the most general,

and therefore the guide for any who propose to follow our directions, the measure of the various sizes may be thus estimated, especially necessary perhaps, because some writers say three-inch, or six-inch pots, instead of *sixties* or thirty-twos. The measure runs thus:—

	Wide.	Deep.
Thumb pots, sixty to the cast, are	2½ in.	2½
Sixties, that is, sixty to the cast. . .	3	3½
Forty-eights, forty-eight to the cast	4½	5
Thirty-twos, thirty-two to the cast . .	6	6
Twenty-fours, twenty-four to the cast	8	8
Sixteens, sixteen to the cast . . .	9½	9
Twelves, twelve to the cast . . .	11	10
Eights, eight to the cast . . .	12	11
Sixes, six to the cast . . .	13	12
Fours, four to the cast . . .	15	13
Twos, two to the cast . . .	18	14

Besides these, there should be a number of bell-glasses, of the sizes necessary for most of these pots, so that the edge of the glass should come half an inch within the edge; pruning and budding knives, and pruning pincers, a very handy instrument, by which a lady may, without exerting much strength, snip off a branch as thick as her little finger; bass matting in skeins or lengths should hang across nails all ready for use, for although the bass gets harsh and dry, it only requires wetting when used to make it tough. Everything should be ready for use without delay, for nothing is worse than to be obliged to leave a job to procure anything that may be wanting. Labels of wood or zinc of all proper sizes, and wooden ones, should be painted black, because when used they should be covered with white paint where the writing is to be placed, and a sharp-pointed stick will make a distinct mark through the white paint, showing the black underneath it; the white paint cannot be laid on too thin at the time the writing is to be done. Wire trellises for climbing plants of such sizes and shapes as are best adapted for the several species, and boxes or pans about six inches deep for the purpose of sowing seeds in, will be found requisite. A small nest of drawers for the preservation of seeds, as well for the borders as the house, and

shelves for placing things on out of the way ; watering pots of various sizes ; a portable garden engine or syringe with roses of various sized holes for the distribution of the water in different degrees of quantity and force. All these things are desirable, and anything short of this makes more work, although it is quite possible to do without any of them but the pots and the soils, and these, if the worst come to the worst, might be put in some corner out of doors. It is not our business to show how things *may be done* ; we have shown how they *ought to be done*, and the nearer these conditions can be complied with, the better. We next come to the

CHOICE OF PLANTS.

As a greenhouse is, properly speaking, a house for the protection of plants from frost, and no more, and is the only description of house in hundreds of establishments, we look for a tolerably miscellaneous collection of different families, likely to make the best show and continue in the best health. A hundred families of plants would do well in a greenhouse, but nobody with any taste would try to grow a large number of families, but would more judiciously endeavour to grow a number of the best varieties in each family of more choice genera. And some few may be commenced with as the most eligible, while others may be left to be picked up as they may be met with and admired. The following are essential, because they can scarcely be beaten for effect :—

AZALEA INDICA, half a dozen varieties ; CAMELLIA JAPONICA, the same number ; GERANIUMS, the like number ; HOVEA *Celsii* and *ilicifolia* ; CHOROZEMA *varium* and *rhombum* ; ACACIA *armata* ; EPACRIS *grandiflora*, *miniata*, *impressa*, and *campanulata alba* ; BOBONIA *serrulata* ; CALCEOLARIA six varieties ; CEREUS *speciosissimus* ; EPIPHYLLUM *Jenkinsonii* and *truncatum* ; (the three latter better known as CACTUS *speciosissimus*, *Jenkinsonii*, and *truncatus*) ; CINERARIA, six varieties ; ORANGE, LEMON, and LIME ; CROWEA *saligna* ; CYCLAMEN *persicum*, and *persicum roseum* ; DAPHNE *indica odorata* ; ERICA, six varieties ; FUCHSIA, six varieties ; HYDRANGEA ; IXIA, six varieties ; TROPEOLUM *tricolor*, *Lobbianum*, *azureum* ; CRASSULA *coccinea* and *fulcata* ; CYTISUS *racemosus* ; LILIUM *japonicum*, two varieties ; VERBENA, six varieties ; STYPHELIA *tubiflora*. Although we could mention plenty more, there are already mentioned eighty-four pots, if there be only one of each variety ; but these are all subjects that may rank high as rich and beautiful plants, blooming at different periods. If the greenhouse would hold more, and a lady is inclined to grow more

species, instead of doubling some of these, let them be selected at nurseries according to fancy. If we had to recommend, we should say double the number of varieties of Camellia, Erica, Cineraria, Fuchsia, Geranium, Calceolaria, Ixia, Verbena, and Azalea indica ; or if not the latter, have duplicates of each sort of the best six. Very few plants could be added with so much advantage to the collection, as increasing the varieties, or doubling those mentioned. We are to presume that these plants are purchased in nursery pots, and it must be taken as a general rule, that no plant must be kept in the nursery pot without examination. Our business, however, must be to take family by family, and so direct the fair cultivator, that no vast error can be committed.

STATE OF THE HOUSE.

The temperature of the greenhouse is important ; a free ventilation is desirable, nay, absolutely necessary, but a current of air is to be avoided ; it is as injurious to plants as to persons. Two doors opposite to each other should not be open, unless the weather is very still, and all the front windows are open also. In cold weather and when the wind is chilly, the door at the windy end should never be opened. It is better to open all the front windows in mild weather, unless the wind blows on them, when they are better closed, and the top lights let down a little. In very damp weather the fire should be lighted to dry the house, and the top lights be lowered to let out the steam. In frosty weather, when there is danger in leaving the house without fire, it should be lighted all day ; and even in a frost the top lights may be down a little, but the glass must be watched, and at night, instead of making up extra fire and closing all the house to increase the temperature, have proper persons to attend, and to see that the house is not warmer, nor so warm if possible, as it was in the day. Thirty-five is high enough for the night, but few trust to it, because three degrees lower is frost ; forty is, however, quite as much as it ought under any circumstances to reach at night, for there is not one greenhouse plant that does so well with fire heat as without it, if there be no frost.

There are different dispositions and habits among the families we have mentioned, but they will all do well in the same house, by giving some the coolest and others the warmest place ; but care should be always taken to have the house cooler by night than by day, whenever it is practicable. Nevertheless, there will be times when the severity of the frost, with a wind to assist it, will so lower the temperature, that all the fire you can give the house may be only sufficient to keep out the cold

and prevent the temperature from going down to freezing point. As regards giving air, even in the height of summer, if there be plants in the house, there should be no thorough draught from end to end; let the top lights be down, and the front lights open, and then there is a circulation all over the tops of the plants, but no draught through them.

PLAN OF A STAGE AND SHELVES.

The front of the greenhouse is the most valuable part; a shelf along the top, just over the front windows, and under the roof, is essential, as it holds all small things that want to be near the glass. The table, or broad shelf in front, at the bottom of the front lights, should be as wide as two feet, for it is of great service for many plants that require constant care and attention; they are easily got at, they are near the light, may be turned round easily every day to prevent their growing one-sided; and this front should be wood trellis-shelving instead of solid, or instead of stone or slate; nevertheless, if it be solid, strips of lath should be laid along, an inch or so apart, so that the bottoms of the pots may not be on a flat place, so as to exclude the air from the drainage-hole. There should also be a good shelf on the back wall near the top for such of the plants as want most air and least warmth, especially for things that rest all the winter, and the main stage should be as near the glass as it is possible to construct it, due regard being had to the growth of the plants. There should not be more shade than cannot be avoided; light is essential, air is essential, and, above all, room for the free play of this air is essential; though it is pretty generally the practice to put the plants in a greenhouse as close together as possible, there ought to be as much room between them as they occupy; and the nearer you can comply with this, the better they will grow. Cleanliness is also one of the great requisites for the health of plants; dead leaves, damp corners, dirty shelves, decaying flowers, and litters of any sort are injurious: whatever the damp can hang about, is likely to produce mildew; the drawing-room itself does not require cleaning more than the greenhouse, if we intend to do the best with the plants.

WATERING THE PLANTS.

The best water for plants is rain; not a quart should ever be wasted. A tub, or a tank, should be inside the house, and the entire rain from the roof should be conducted by a pipe to the inside; nothing is more simple and attainable, nothing more valuable than a contrivance for a supply of rain-water. Next to this it is desirable to have it the same temperature as the atmosphere of the house.

One-half the plants that are unhealthy have been chilled by the watering, and, in many places, where they can only get spring water, they are very unsuccessful; some do not know why, but there is no difficulty about establishing the fact. Hard water is injurious, mineral waters are often so; river water is next to rain in value, if it be soft; but even that ought never to be used cooler than the air of the house. Pond water is next to river, if there be nothing noxious flowing into it, but all of these are poor apologies for the rain-water, conducted into the house. Some caution is required in one respect; when the wood-work has been fresh painted, the water will poison anything, so that it must be turned away until it neither tastes nor smells of the paint. In the mean time, some pains must be taken to get good water. With regard to the mode of administering water, only those within reach may be said to belong to ladies' work; but it is quite necessary they should set one who understands it to do the rest, for too much or too little water is fatal. No plant should be watered while the soil is moist; but it is as essential, that when it is watered, all the soil in the pot should be moistened. There is another point that requires attention. If, while other plants are apparently dry, any one seems wet, it should be examined, to see if the drainage be free; because it will be obvious either that the plant cannot absorb so fast as the rest, or that the water has not the means of draining away; if it appear that the drainage is clogged, the ball must be relieved of the crocks or other matter put in at the bottom, and which will appear to have got the soil run among it, and fresh crocks must be put in. A plant suffers as soon from want of the supply of air, and a too great supply of water, as it does from a deficiency. The cistern, tub, or tank, being handy to draw or dip water from, a lady can use just such sized watering pot as is most convenient to handle, and go round the plants to give only such as are dry the requisite moisture, not just a sprinkle at top, but as much as will cause a surplus to run out at bottom. The earth should be examined to see if it be close to the side, if not, the watering has been too long neglected; for the first symptom of suffering, or danger of suffering, is the shrinking of the ball of earth, and if this be not noticed, the water then given proves useless, because it runs down the vacancy between the ball and the pot, and does not soak in at all.

MANAGEMENT OF AZALEAS AND CAMELLIAS.

The *Azalea indica*, and *Camellia japonica*, are as hardy as any of the greenhouse plants, and want as little labour as any, although they must have attention. When these plants

are advancing their buds towards blooming, they want abundance of water, and to be placed in the part of the greenhouse least subject to draught, or wind. They will do on the general stage, and may be, for the sake of appearance, set about in different parts, but not too near the door. They should be turned frequently, so that one front should not be better than another, and they will keep in flower a long time in perfection. As the flower goes off they begin to make their new growth; they want turning daily just as much in this period as any, for they are shaping themselves, and if left to themselves without being moved, they would assuredly grow one-sided. In the middle of June they may be taken out and placed in a sheltered spot, with plenty of room, distantly shaded from the extreme heat of the sun; and if there were a canvass house, such as tulips are grown under, nothing could be better, because they can have all or part of the air or sun according to their wants, while they can be entirely protected from those drying winds which injure every tender or half-hardy subject that is exposed to it; but, in the absence of this, we must be content with the most sheltered spot we can find in the garden. The ground should be such as the roots cannot penetrate, and the watering must be attended to diligently; nor ought a rainy period to prevent the same attention, for it will often be found that a bushy plant throws the rain entirely outside the pot, they therefore require examining in rainy weather as well as in fine. When they have made their growth complete, they ought to be placed in the coolest and driest part of the garden, and the quantity of water lessened considerably; they will want only such moisture as will keep them alive, and as they do not absorb much while at rest, this will be very little. In September you may restore them to their places in the house, first examining the balls of earth to see if their roots are matted round the sides of the pot; if so, change these pots for those of a size larger. When the plants have done their bloom and are making their growth, whatever is growing out of form should be cut off. If you want to propagate the *Camellia*, do it by inarching, and the *Azalea* by cuttings, in sand, under a bell-glass, and if you have it, in a slight hot-bed, with a little bottom heat. The *Azalea* and the *Camellia* grow best in loam (No. 2) two-thirds, peat (No. 1) one-third, and the pot should be one-fourth filled with crocks.

THE CINERARIA, VERBENA AND CALCEOLARIA.

These plants are idle and rest in the winter months, but flower a considerable time when they begin. They require a good supply of water when they begin to grow, and should

be placed near the light when their flower-stems rise; when they decline their bloom, they may be parted at their roots, or their side shoots taken off with or without roots; if without, they should be potted and covered with bell-glasses, but if with roots, they may be placed in a shady spot in the garden, on a hard bottom. Strictly speaking, all three of them may be called frame plants, but the distinction is not easily defined, and they do well in a greenhouse; they may be placed on the highest back shelf in September, and will seldom require watering; but, in a good stock of *Verbenas* and *Cinerarias*, the plants need not be parted nor propagated, and the pots may be enlarged by change. Many of the plants will flower in winter and early spring. It is only the small newly made plants that need be put up out of sight, for anything that gives a flower in the winter is acceptable. Some of the *Verbenas* will be dwarf, others require to be supported on a trellis, but the young ones may be turned out into the borders and beds in the spring to flower the whole summer. The *Calceolarias* will also require supports for their main flower-stems sometimes, though those are the best that support themselves. The soil in which these plants thrive is, half loam (No. 2), a quarter cow-dung (No. 7), and the other quarter peat (No. 1), well mixed. The cuttings strike easily in pots filled all but an inch with the soil, and one inch of sand; the bottom of the cuttings should touch the soil and go through the sand, but not enter the compost, though they will send their roots into it when they strike. To grow any of these large, they must have constant shifts from small to larger pots. All dead leaves must be removed.

ERICA, EPACRIS, CHOROZEMA.

This family is perhaps the most difficult to manage, because so small a neglect is fatal. The soil in which it succeeds best is poor, at least, comparatively so, for it is easily destroyed if much excited; the compost that answers best is four-fifths or parts of (No. 1) peat, and one-fifth or part of loam (No. 2). If it happens that the peat is not sandy, it may be necessary to put sand to it, not exceeding one part. Good turfy peat is, however, generally sandy enough. This should be well mixed together, so that the roots shall find all the soil alike, and not more loamy in one part than another. This compost being comparatively poor, and very pervious to water, the greatest possible attention is required as to the watering; and this may be generally applied to soils of which the greater part or any considerable part is peat, for the water runs through it quickly, and when it is once neglected till dry, the plant suffers, if it does not die. Every time a heath

wants water too long together, some of the lower leaves turn yellow and fall. This makes so many naked stems to heaths of any size, but a worse effect is caused by giving too much, or by the stoppage of the proper drainage of the pots. The more full a pot is of roots, the more constant must be the watching and necessary watering, because the water cannot be held so long by the small quantity of matted soil as if there were but few roots. In some cases a heath may be wanting water twice a-day. The cuttings of heaths should be taken from the last produced shoots, two inches, or one inch, in some cases, long; the lower half should be stripped of the leaves, and the upper half have all left on. Get a pot of heath soil filled, all but half an inch or an inch of sand, according to the cutting; water the sand so that it may be saturated with wet, and stick in these cuttings so that they just touch the soil, but not go into it; cover with a bell-glass, water with a very fine rosed water-pot, so that the sand shall never be thoroughly dry; wipe the glass dry inside every morning; let them be in a cool part of the greenhouse, and be shaded from the sun; when they set off growing well, you may conclude they have struck root, and pot them in sixty-sized pots. They may be kept in a common garden frame all the summer, if you please, or in the most airy part of the greenhouse. Here they may be shifted as they fill the pots with roots, and require but the ordinary attention.

GERANIUMS.

The soil, for the healthy growth of this family, may be of loam (No. 2) three parts, dung (No. 7), or for want of it droppings (No. 10), or if neither can be had, dung (No. 5) one part; peat one part, well incorporated. Cuttings may be struck whenever they can be got, but the usual time for any quantity is July, when everybody cuts down the old plants. These require no care whatever. If they are put in the open border, they will strike; but those who have choice kinds will cover with a hand-glass, and place them all in the shade; when struck, pot them in sixty-sized pots, pinch out the top to induce side shoots, and leave them out of doors until September, simply changing their pots if they get too full of roots; when removed to the greenhouse, examine the roots, and, if necessary, remove them into larger pots, and place them among the other plants to take their chance. The large plants, when they have done flowering, may be cut down to such skeleton shape as shall give a chance of growing handsome; and let them remain out of doors, shifted into a size larger pot, or trimmed up about the roots to go into the

same with fresh loam. In September remove them also to the house. If any of the shoots come so as to cross others, rub off those which are least wanted, to give strength to the others and keep the plant in form. If any shoots grow too vigorously for the rest of the plant, pinch off the end, and so regulate the growth in this particular, that it may be handsome. As the blooms come out they will require shading, or they will not remain long in bloom. When in flower, you do as you please with them until the flower declines, and then turn them out of doors, cutting them down again in July, putting them back into the house in September.

CEREUS, EPIPHYLLUM, CRASSULA.

These subjects take any soil better than that which has been popularly recommended. They do not require to be starved. A compost made of loam (No. 2) one half, peat (No. 1) one quarter, and dung (No. 7 or 10) one quarter, will grow them well. They want but little water all the winter, and as their buds begin to swell they may have a supply. After they have done flowering, turn them out of doors, place the pots under a south wall, or in the hottest part of the garden. In September, remove them to the house again. The Crassula may be struck from cuttings as easily as the others, and if left on the ground without inserting at all will throw down its roots sideways into the earth of itself. Small pieces, however, are generally selected, and after drying the juice, inserted in small pots, where they are treated from the first like plants, and shifted from time to time as they fill their pots. The Crassula carries its blooms on branches at the ends of the shoots; consequently, as soon as it begins to grow from a cutting, the ends are taken off to induce side shoots, and thus form a handsome bushy plant with many heads of flowers, in the one case (coccinea) scarlet, in the other (falcata) orange. The shifting is always best after the flowering is done. The Cereus and Epiphyllum require much such treatment at first. *E. truncatum* should be stopped until there are branches enough to hang down all round the pot, for the habit is weeping, and the flowers come on the ends of all the branches.

GENERAL RULES FOR THE MANAGEMENT OF GREENHOUSE PLANTS.

In mild weather, and during winter in particular, if there is a warm gentle rain, a greenhouse plant of any kind is greatly benefited by exposure to the air; not that it is possible to remove all the plants in a greenhouse out of doors whenever the sun shines in winter, or a warm shower comes, but it is

as well to know this, because we all have our favourite plants, and we can always put out a few of these when the weather is favourable.

Never indiscriminately water the plants in a greenhouse, because where there is a mixed collection of various families, some will be found to absorb much more water than others, and it is quite as bad to give too much as too little water. Half the plants in dwelling houses are spoiled by excessive wet, and especially where the pots stand in saucers to prevent the wet from running over the place when they are watered. In greenhouses we have seen this where ladies are very fastidious about the cleanliness of the shelves; but laudable as cleanliness may be, it is running the greatest possible risk to let plants stand in water. Occasionally examine the pots, and turn out the balls of earth to see if the roots are matting round the side, for it is the best rule for removing a plant to a pot of a larger size. If the plant is growing, it requires it more than a plant at rest; for a plant at rest should never be excited until it begins to advance of itself; besides, when a plant is set for bloom, and about to take its rest, until the buds swell, by a sudden excitement, such as being placed in fresh earth, or having too much heat or water, the bloom-buds get blighted, and the germs of the leaves and branches take up the growth, the former being unable to take the fresh supply, because flowers can only take a certain quantity, and the others being unlimited in their means by naturally extending themselves so long as there is a competent supply. The time, therefore, to examine the roots, is when a plant begins to make its growth, or at the decline of the flowers. There need be no other rule for changing pots, but the filling of the one with roots; generally, however, once in a season is enough for established plants, and that is after they have flowered, and before they make the next season's growth.

Constantly turn plants round to prevent their growing shabby on the side which is in the dark, or comparatively so; and also to prevent its making only one handsome front. All plants should be alike on every side; and although it may give some trouble, it amply repays us by the improved condition. Nothing looks worse than a plant with but one good face, and the others discoloured, or leafless, or warped. Always give plenty of room to plants; the light and air should be able to reach them all round. The best rule is to let there be just the same room between the plants as the plants occupy; but greenhouse room is so valuable, that this is rarely allowed. Nevertheless, it does not alter the

fact, that the more room plants have, the better they grow; and nothing does more harm than to place them close enough to darken the backs of the rows.

If you want plants bushy and short, you must keep pinching off the ends of branches that grow upwards; but, as the perfection of a plant is to be full of branches and leaves to the very edge of the pot, this operation of pinching must begin early, even when the cutting has just struck, or the seedling, if the plant be from seed, be only three or four joints high; but those plants which grow pyramidal in form must have the leaders preserved, and should only have such branches stopped as are inclined to come too long,—such as shoot out faster than the rest.

Deciduous plants should not be watered after they drop their leaves; but when they begin to swell their buds, they may be supplied with a little moisture, to be increased in quantity as soon as they shoot out their branches.

Seeds of greenhouse-plants are best sown as soon as they are ripe. Nature points out this for all seeds; but artificial culture, or a change of climate, suggests various changes in the plan of doing many things; for instance, a tender plant may be sown in the open borders, in the spring; and as it will meet with no frost until the autumn, it is quite proper to do so; but if the seeds were sown directly they were ripe, they would come up only to be killed by the frost. Not so with greenhouse-plants: they are in a proper climate. If they come up, they will grow without interruption; and if they are in the habit of lying in the ground till genial, or, we ought to say, till warm weather, where they grow naturally, they will do the same in the greenhouse, unless the temperature be prematurely raised. In all matters of doubt, we ought to make sure on the safe side. Foreign seeds, therefore, ought to be sown the instant we get them; because, next to sowing them at the time nature herself sows them, it is well to do so as soon after as possible.

All seedling plants are the better for pricking out, or transplanting, as soon as they have three or four leaves; and the most effective of all methods is to get small-sized pots—say *sixties*—and plant the seedlings round the edge, close to the side of the pot, about three in a pot, or four, or even five, if they are small slow-growing things. They derive the greatest benefit from their roots reaching the sides of the pot.

As you may be at a loss for the soil in which a new plant grows, use a compost that everything will live and grow in, and leave to time and experience any improvement you

may make. Take loam (No. 9) which is presumed to have no dung or other exciting matter in it, droppings (No. 10), or, for want of it, dung (No. 5), peat (No. 1), and leaf-mould (No. 4), in equal quantities; and if it be too adhesive, take half a part of sand to make it more pervious to water, or at the most a whole part. Mix these well together. It will suit everything a little; and if the plant does not do all you wish, you can at least grow it well enough to get cuttings from, and try them in lighter, poorer, or richer composts; but as we know camellias, geraniums, heaths, and succulents, will grow in it,—and these are very much opposed in their natures,—it is fair to presume that any plant will grow in it enough to answer the temporary purpose of saving it to grow others from. Keep all shelves free from wet and dirt; have grooves cut along the middle of them, for the water to run along, instead of dripping off along the edges, and provide for the drip at the end, so that it does not make any mess, or dirt, or litter, at the part it runs down.

Provide, if possible, the means of shading the greenhouse in any hot or bright weather, as, in the spring, when the azuleas, hoveas, and many other fine plants are in bloom, a few hours' sunshine would shorten their duration some days. A canvass roller-blind outside is very easily contrived; or a thinner blind of calico, or some such material, inside, would have as good an effect, and be somewhat lighter. But shade from the excessive heat of the sun will make several weeks' difference in the lasting of the blooms. It must, however, be recollected, that, as whatever excludes the light in any part of it is an evil,—and, therefore, shading a choice of evils,—the blind must not be down an hour more than necessary.

When the bloom of a plant is over, you have to make up your mind whether you intend it to seed or not. If not, pick off all the remains of flowers, that the pods may not swell; for the seeding of any plant stops, in a great measure, the growth. If it be past the middle of May, you may turn a plant out in a sheltered part of the garden, for want of better accommodation; but if you can give plenty of air in the greenhouse, and shade from the extreme heat of the sun, plants may as well complete their growth in the house as not; for it is not desirable to expose them too much, nor do the lovers of plants like to see the greenhouse empty.

As camellias and azaleas, cactuses, epiphyllums, and many other subjects, are turned out to harden their growth and get the benefit of air in summer, the greenhouse may be supplied with annuals. Balsams, cockscombs, clintonia, salpiglossis, rhodanthe, and other tender

annuals, may be sown in a hot-bed in March or April; and, although they require particular treatment for large specimens, may be planted out in pots, and grown still in the hot-bed, until the time they are wanted to supply the shelves of the greenhouse.

In August, everything ought to be cleared out, and the roof of the greenhouse should be well syringed; all the dirt washed from the glass, the walls, posts, shelves, and every part. Cleanliness is everything with plants; and the house should be thoroughly clean before the plants are put in for the winter. Nor is it at all a bad precaution during the period that it is empty, and before the syringing, to fumigate it well with tobacco, and afterwards with sulphur. The one will kill everything upwards, the other anything downwards. The syringing should be done with such force as to drive everything out of the corners.

When the plants are taken into the greenhouse, let the surface of the earth be stirred, the pots cleared from anything that they may have attained in the way of dirt, snails, or vermin, or anything that will cling to the outside or in the holes at the bottom.

Let the paths and floor of a greenhouse be kept dry and clean: it ought to be a paved floor, or a concrete, or some other impervious to wet; and provision should be made for the running off of all the water that may fall to the ground; for if the ground absorbs wet it too often engenders mildew.

Plants should never be trusted to the open air before the middle of May, nor remain out after the middle of September. All before or after this is running a considerable risk.

Grapes may be grown in a greenhouse, if the growth be confined to a branch for each rafter to fruit, and the shoot which is trained alongside of it for the next year's bearing. This does not materially exclude light, but any more would be injurious; and even this must not be attempted if the shelves are to be filled after the present crowded fashion, in which the plants touch each other, and form a complete shade for the backs of the whole. The Sweetwater and Black Hamburg are the only sorts which should be tried.

Hot-water pipes are the best means of warming a greenhouse in winter-time, but better avoid lighting a fire as long as possible. Mats hung up in front are a great protection to the plants, and that is always the coolest part of the house; but when the glass is down to thirty-five, there may always be expected a frost in the night, or at least it should be provided against. The man who looks after the fires should be on the alert, and the mats in front should be always hung up in doubtful weather, because it is little trouble, and does no harm to the plants.

TREES AND SHRUBS FOR FENCES.

(Excepting the Hawthorn.)

BY THE LATE JAMES GRIGOR OF NORWICH.

HAVING had considerable experience in the formation of hedges under every variety of circumstance, and in all descriptions of soils, I proceed to lay before the public the result of my practice, passing over, agreeably to the conditions, the common Hawthorn, a plant which is universally known in the construction of fences.

I shall enumerate the kinds according to their importance as fence plants. This importance I measure by the variety of soils and situations in which they thrive, their rate of growth in a given time, their rigidity so as to withstand pressure, their branchiness so as to cause shelter, and their durability. Agreeably to this plan, then, I begin with the

BLACK SALLOW (*Salix caprea*).—This tree, which is frequently called the Goat willow, is not generally known or cultivated; but it has of late years attracted notice in some districts as a plant which successfully withstands the effects of the sea air. It is, however, destined to accomplish a great deal in inland situations in the shape of hedges. I have seen it in every description of soil, except peat moss—on dry hard gravel very much exposed, by the side of rivers where there is an excess of moisture, and on all intermediate soils and situations with the single exception referred to. Its chief merit, perhaps, is that it forms a protection *at once*. From the day on which it is planted, it becomes entitled, so far as security of property is concerned, to take its place with a hawthorn fence of seven years' standing. These facts I gather from a hedge of this tree now growing on my own ground; and in order that I may be clearly understood, I shall give the details of how it was formed. My first trial with this tree was with small cuttings of fourteen inches in length, placing them at about nine inches apart from each other. Those grew well, but the fence so formed is not strong enough, and gives way when subjected to pressure. In order to have a rigid framework at the commencement, I procured a waggon load of strong strait rods, six feet in length, and about one and a quarter inch in diameter at the lower end. Those I planted



in the autumn, fourteen inches deep, in the way here indicated—tying them tightly together with willows at each intersection,

which prevents their rubbing against each other during high winds, and adds greatly to their power of resistance. As soon as planted, they were sufficiently strong to keep in cows, sheep, &c. The first year they made shoots about nine inches in length, those shoots being very regularly disposed over the rods, and not, as might have been expected, on the tops of the rods only. It is of importance to observe here that the more slanting the shoots are placed, the more regularly will the buds break all over, and that if set perpendicularly, or nearly so, they can scarcely be made to assume a hedge-like character, strong leading shoots rising from the tops without sufficient spray underneath. It is also of importance to observe that the shoots, of a necessary thickness and straightness, can be only had from stools grown and treated in the same way that the underwood throughout England is managed; that is, when hurdle-wood is the object. A plant of a few years' standing is cut down in autumn close to the ground: in spring it sends up several straight vigorous shoots eight or ten feet in height: these are allowed to remain three years, when they undergo the same process by being cut down. Without such a nursery, the proper materials for this kind of fencing cannot be had. The great value of this tree consists in its adaptation to almost all soils and situations, and particularly in its being available at once as a protection, which is not the case with any other tree. It would grow freely as a fence-plant throughout the highlands of Scotland, if a trench were opened for the rods, and the soil properly loosened at bottom. This description of fence should be trimmed or clipped every season during the month of June: a second growth will follow the dressing at this date, which will considerably thicken the spray; and in situations near to dwellings, &c. the fence had better be reduced to an even and uniform outline in the latter part of October, which will also tend to its closeness and beauty.

2. THE SCOTCH PINE (*Pinus sylvestris*).

This tree triumphs over a great variety of soils and situations, and perhaps it no where more forcibly shows itself adapted to the most barren and exposed districts than in the north of Scotland, on the left hand side of the Grantown road, before reaching the Dava Inn, on the property of the Earl of Seafield. In this particular district, it forms the only species of tree to be seen; and I refer to it in this instance to show what use might be

made of it in similarly situated districts as a fence plant. The best examples of it, in the shape of a hedge, are in Suffolk, where it skirts the highway for miles between Thetford and Newmarket, and where it is made to assume all the uniformity and smoothness of our twiggy hedge-trees. Three or four-year-old plants should be used, but on no account should they be taken unless they had been transplanted during the previous year in the nursery, for otherwise the roots are hard and bare. They should be placed six inches apart from each other, and the pruning may be safely deferred till the second year after planting. It will be five years before this fence reaches the height of five feet, when it will present a complete barrier to cattle, and an excellent shelter to surrounding crops. This sort of hedge should be allowed to spread itself out at bottom to the distance of two feet on each side, otherwise the branches become unmanageable and refuse to throw out small spray. The chief situations which I should recommend for this description of fence are those exposed and poor districts capable of improvement in the highlands, and on all poor lands in the lowlands. Though it will grow tolerably in unprepared ground, it is by no means insensible to kind treatment, and I would strongly recommend a trench to be opened for the plants, and the soil loosened to the depth of two feet. The consequence of this is, that a hedge will be formed two years sooner than by planting without any preparation. A fence of this description in my ground (two-year seedling plants having been used,) was formed two years' since, and it now averages the height of two and a half feet. The soil on which it grows is a loose red gravel.

3. THE LARCH (*Larix europæa*).—My opinion of this tree is that it nearly equals the Scotch pine in every respect excepting warmth in winter. In planting a hedge of this description, care should be taken to use those plants only which stood thinly in the nursery lines, for if those which had been crowded together be planted, a serious difficulty will present itself in causing the plants to feather close to the ground. It will be readily answered by some, "Cut off the tops and then they will be sure to spring at bottom." I find, however, that this does not answer, the strong leading shoots being indispensably necessary to give rigidity to the hedge. The plan, therefore, is either to use two-year transplanted plants, which are well branched at bottom, or to have those of a younger age, which always break out well when free on both sides. I hold it as indisputable that the leading shoots of a larch fence should not be cut till the fourth year, before which time I

have never seen one with the necessary "bones and sinews." Though it will grow in almost all soils, it must not be expected that the larch will in all situations wear that beautiful green which distinguishes it in loam and clay, or on the slopes of hills; and in the shape of a fence it will be found to display considerable diversity in height and vigour, according to the differences of soils; but this may be in a great measure avoided by helping the weak parts with a little *well-rotted* manure dug in about the roots. There is one advantage which the larch possesses over every other hedge plant, and that is, that grass will grow close up to it, and that though the roots impoverish the soil, the leaves or shade of this tree is not hurtful to pastures. Until it is completely formed, the larch should be clipped during the latter part of June, and again in November; but after the fence is complete, a trimming at the latter date will be sufficient.

4. THE LOMBARDY POPLAR (*Populus fastigiata*); and THE BOX-THORN (*Lycium europæum*).—The former is a very fast-growing tree, but is not very lasting. When subjected to the hedge-bill, it throws out thick clusters of spray, which, though not very regularly disposed over the surface, are yet calculated to produce considerable shelter. The more common sorts of honeysuckle are often intermixed with it when planted as a hedge, and together they form a tolerably good fence. Instead of the honeysuckle, however, a much better substitute is to be found in the box-thorn, which grows rapidly, is very hardy, and frequently bears spines like the hawthorn. This box-thorn will grow anywhere, and is most readily propagated by cuttings. Throughout England, it is very currently called the tea-tree, a name which it has acquired through a very trifling circumstance,—the label belonging to a tea-plant having been put on to this tree by mistake, and forwarded, along with other plants, to one of the Dukes of Argyle, who, it appears, had one sent to him before it was generally known. It does not grow sufficiently close to choke and eventually overcome the poplars with which it is mixed; so that a fence of this sort will last for many years, and bear the hedge-bill extremely well. Some recommend the box-thorn as a hedge by itself; but this can only apply to gardens where it is not exposed to stock, &c. In the fields, it will certainly prove a failure if used alone. The cuttings of the box-thorn should be planted in the autumn, after the falling of the leaf.

5. THE BEECH (*Fagus sylvatica*).—No tree makes a better fence than the beech; but it restricts itself to arable and pasture lands; and on these even, it will not grow freely

unless the soil is prepared. In rich ground, it should be planted in preference to the hawthorn, for it grows very rapidly, is very beautiful in summer, and, in such situations, retains a great proportion of its leaves during winter. In order that it may be safely trusted where cattle are grazing, a double line of plants, eighteen inches apart, should be inserted, and these ultimately form a strong framework on either side, sufficient to resist the attacks of any description of live stock. In poor peaty soils, or on high exposed districts, it will not grow well; but around homesteads, and the fields adjoining, it certainly deserves more general cultivation. The time for trimming the beech is the month of October; but neat workmanship cannot be performed, in this instance, without the hedge-shears. The proper plants to be used are such as have stood in nursery-lines for two or three years. In the fence-lines, they should be placed at about one foot apart; and if well-rotted manure is used, it will materially hasten their growth.

6. THE SLOE-THORN (*Prunus spinosa*).—This is one of the few plants that will grow tolerably well in sand, and in heath land where there is a considerable portion of peat-soil. It rises naturally throughout England, but is very rarely cultivated in Scotland, though it is unquestionably hardy enough to grow there. In good soils, it is a rapid grower, forming strong spines, and lasting as long as the hawthorn. It is very important to bear in mind that all blackthorn plants used in hedges should be raised from seeds, and not from suckers, as, in the latter case, the roots spread throughout the adjoining lands, and threaten to overrun whole fields. When seedlings are used, this does not take place, except in rare instances. The berries are ripe in November, when they should be gathered, and laid in a heap of sand, and mixed with it frequently during winter. They should be sown in the month of February, or early in March, during open weather, and covered fully an inch in depth. In the seed-beds they may remain two years, then transplanted in lines fifteen inches apart, and about three inches from plant to plant. In the nurseries, seedling plants may be had at 7s. 6d. per thousand, and those ready for fencing at 12s. 6d. per thousand. In all cases where the subsoil is unbroken, the hedge-line should be trenched, and the plants inserted six inches apart from each other.

7. THE CRAB, OR WILD APPLE (*Pyrus Malus*).—The proper plants of this tree for hedge-fencing, are such as have been raised from wildlings, or the true crab,—such as are grown from the seeds of grafted apples being frequently spineless. Three objections have

been urged against this tree as a fence-plant: its high price, its liability to insects, and its refusing to grow freely except on sandy loam. The first may be safely pronounced a mistake; for, on taking up any respectable nurseryman's Catalogue, it will be found that the price for suitable plants is from 15s. to 1l. per thousand,—a rate very little higher than that demanded for white thorn. In some seasons, it is certainly liable to be attacked by caterpillars; but beyond the unsightly appearance which ensues, there is but little harm done. Its love for deep loamy soil, and for no other, is certainly correct; but it should be remembered, that when it meets with such, it excels all other hedge-plants as a free grower, and as a stubborn, lasting fence. Those plants which are sold about 1l. per thousand may be placed eight inches apart from each other; and such as are stronger, at one foot from each other. When the plants are inserted, they should be all cleanly topped with a sharp knife, at about four inches from the surface of the ground; and if the soil is properly manured, they will send up, during the first year, luxuriant shoots a foot or two in length.

8. THE ALDER (*Alnus glutinosa*).—I have proved beyond any doubt, that, if the land is sufficiently loosened, this plant will grow very freely in peat, sand, and in the worst description of soils. The usual impression is, that it is suited only to bogs and damp meadowland; but I have no hesitation in stating that this is by no means the case: in trenched land, by the sea-side, and in the most exposed districts, it thrives luxuriantly. As a hedge-plant, it is rough and uneven, not willing to lose its form as a tree; but after it has been moulded for a few years, it makes a very good fence, and sends out small spray much denser than might be expected. Young plants, such as have been transplanted for one or two years only, are better than old ones; for the latter are generally devoid of branches at bottom,—a defect which is not easily remedied. Suitable plants may be obtained at the nurseries for 15s. per thousand. They should be placed six inches apart from each other, and trimmed every year, in September, with the switching-hook.

9. THE SPRUCE (*Abies excelsa*).—In one description of soil—that of a damp loam—no tree excels the spruce as a fence-plant. It will grow well, for a few years, in any kind of land; but in shallow soils, such as sand and gravel, it will soon become stunted, assuming a yellowish hue, and losing its under branches. This last circumstance renders it very unfit for being used generally. However, in all situations which are inclined to be damp, and especially in those with a north-east aspect, it will assume, and retain for many years, a

closeness and luxuriance not excelled by the yew or box. I have always found that it is good policy to allow a fence of this description to occupy at least two feet in width at bottom, the side branches being strong, and a narrower space being insufficient to allow them to develop themselves. Two-year transplanted plants may be placed a foot apart from each other; and if any manure is to be added, it must be very well rotted,—all the individuals of the *Coniferæ* having an aversion to fresh manure. The universal practice, so far as I know, is to trim this sort of fence with the hedge-shears,—a process which well repays a little extra labour. This may be done in the month of August or September. The price of plants in the nurseries is from 12s. to 15s. per thousand.

10. THE ELDER (*Sambucus nigra*).—In all situations which are found too damp for the hawthorn, the elder may be planted with every prospect of success. It is wrong, however, to restrict it, as is generally done, to swampy districts. Wherever the soil is loosened to the depth of twenty inches, it will grow freely. I have seen it flourishing on the tops of hills amidst sand and gravel; and not the least of its services are performed in the shape of hedges by the sea-side, where it forms an excellent protection to plants which, without its shelter, would not grow there. In trenched soil, cuttings planted towards the end of October will answer almost as well as rooted plants; but in untrenched land it is advisable to have the latter. For the first three years an elder fence should be cut only once every season; but afterwards this may be done twice—in June and October, which will have the effect of inducing it to send out thick spray. Plants may be inserted at a foot apart from each other, and cuttings at half that distance. Two years' transplanted plants are sold in the nurseries at 1l. 10s. per thousand.

11. THE BARBERRY (*Berberis vulgaris*).—I know of no description of soil in which the barberry will not grow. It is true, it dislikes bogs saturated with water; but here it is the excess of moisture that offends it, and not the soil. On chalk, peat, and sand, it is an unflinching grower. On loamy lands, with a calcareous subsoil, it is one of the best of hedge-plants, growing so rapidly, that in the course of three years it makes a good substantial fence. On the very poorest description of soils its branches are occasionally found decayed; but strong living shoots invariably supply their place, so that there is never found an absolute break in the fence. A prejudice exists against this plant, on account of its supposed influence in causing blight and mildew; but it is well known that

the fungus which infests this tree is an *Æcidium*, whilst the blight on corn is an *Uredo*; so that there is no danger whatever in bringing it in contact with wheat-fields. It is to be hoped, therefore, that a plant so very useful, and triumphing over so many bad soils, will be brought into more general cultivation. Though it will well repay every attention that can be bestowed in the preparation of the soil, manuring, &c. it never refuses to grow though indifferently treated. The plants should be placed about nine inches apart from each other, and trimmed afterwards with the hedge-hook. From the natural denseness and bushiness of its roots, it is by no means necessary to use transplanted plants: well-grown seedlings, two years old, will answer equally well; and those may be had in the nurseries at 10s. per thousand.

There are a few other plants which might be enumerated as fit for hedges; but my experience concerning them is not sufficient to warrant my speaking of them in detail. I think it is probable that the buckthorn (*Rhamnus catharticus*), will soon be adopted as a fence-tree; but at present, the demand being limited to the species as fit for shrubberies only, it would be difficult just now to get it in sufficient quantities for the former use.

GARDENING MEMORANDA FOR DECEMBER.*

THIS month we ought to treat everything as if it were a continued October and November. All the planting and ground operations, that are not completed, should be persevered in, and no time be lost. The pruning of vines, wall trees, and standards, should be done as soon as possible, and all that require it be nailed fast to their proper places. The removal of fruit trees may go on. The making of new walks, beds, clumps, shrubberies, and gardens, must be hastened, and it is perhaps the best time of the year to drain where draining is necessary or desirable. Ornamental water may be formed or altered, excavations of lakes ought to be accompanied by the formation of hills, and if there be bold rock work imitated next the water, it aids in the general effect of a good landscape. Litter should be provided for all the crops, flowers, and plants that require it; half-hardy, or tender plants, put out of doors, should be protected with mats, tan over their roots, or a complete case, according to their nature. In bad weather, find work under cover; there are always plants

* A very elaborate and complete Calendar of Gardening Operations for December is published in No. 36 of the Horticultural Magazine.

in some of the houses want putting into larger pots, cuttings or seedlings to pot off, crocks, labels, or flower shrubs to prepare, seeds, bulbs, and tubers to examine, and various other things to do that we might neglect doing in fine weather. This seems inevitable. In frosty weather when the ground cannot be worked, collect manures, such as peat earth, sand, loam, cow and horse droppings, poultry dung, &c. But unless the frost is very hard indeed, many ground operations go on as usual. Then there is the job which we seem never to have done, though always at it, the pruning of trees, shrubs, and vines. The standard trees of an orchard would find work for any number almost to do them justice, and rarely do any gardeners attempt it; they are content with blighted stunted fruit, when they might have it fine, and would rather see them all manner of bad shapes, and the fruit out of reach to require shaking down, and bruising and spoiling, than get up and cut away the useless wood and shorten the height, so that the fruit might come large and be all within reach. We could almost write a chapter on this shamefully-

neglected subject. The rest of the duties of this month depend chiefly on the weather, but all the precautions against frost, cold winds, heavy rains, snow, hail, and stormy weather in general, should be taken at night, as if some of these visitations were certain. The taking of plants into the greenhouse, stove, or forcing-house, to bring them forward, is almost a routine business, and a general rule against watering much, applies through all the winter months.

THE TEMPERATURE AT WHICH PLANT-HOUSES SHOULD BE KEPT DURING DECEMBER.

The Greenhouse.—From 40 to 50 degrees by day, and from 36 to 40 degrees at night, or just safe from frost.

The Conservatory.—About 55 degrees by day, and from 45 to 50 degrees at night.

The Plant-stove.—About 60 degrees by day, and about 50 degrees at night.

The Orchid House.—The warm, or Indian house, 65 to 70 degrees by day, and from 55 to 60 degrees at night. The cool, or Mexican house, 60 degrees by day, and 50 degrees at night.



METROSIDEROS ROBUSTA.

METROSIDEROS ROBUSTA, *Allan Cunningham* (robust *Metrosideros*).—Myrtaceæ § *Leptospermeæ*.

This is a fine robust evergreen shrub under cultivation, acquiring, in its natural condition, the size of a large tree, "not unusually attaining the height of eighty feet." It, however, blooms under cultivation when not more than a yard high, and may be had from that

size up to the largest that can be conveniently accommodated in a greenhouse. It is a New Zealand plant, and is called by the New Zealanders, *Ratu*. The wood is very hard and durable, owing to the closeness of its grain, and hence it is found a valuable article in the construction of agricultural implements, and in ship-timbers, &c.

It forms an evergreen shrub of robust

habit, branching repeatedly in a forked manner, which gives rather a singular appearance to the arrangement of the young branches, most particularly observable on young or moderate-sized plants. The leaves are opposite, of a neat oval or elliptic figure, and quite flat; they have, moreover, a rich aromatic odour. The flowers, which are scentless, grow near the end of the shoots, in smallish dense clusters, and consist of a cup-shaped green wavy disk, surrounded by a ring of long crimson stamens, the thread-like filaments of which form the conspicuous portion of the flowers of this group of plants. These flowers are produced freely in June, at which season the plant is very ornamental; its neat evergreen foliage rendering it at other times cheerful and pleasing.

It was introduced from New Zealand to the garden of the Horticultural Society, by J. C. Bidwill, Esq., in 1845, under the name of *Myrtus robusta*, under which appellation it is now sometimes met with in other gardens.

It is a desirable shrub for a conservatory or for pot-cultivation in a greenhouse where there is space for vigorous growing specimens. The soil in which it should be placed is a mixture of equal parts sandy loam and peat earth, rendered porous, if need be, by the addition of silver sand. The pots should be well drained, and of tolerable size; or, in other words, the plants should not be too much cramped for pot room, at least until they have grown enough to form themselves into handsome bushes, when a more restrictive treatment may keep them for a longer period within bounds, and also induce a more general production of blossoms. It does not at any time require a high temperature, that of a greenhouse being quite sufficient for it. Like other similar subjects, it must be propagated by cuttings of the partially matured young shoots, planted in sand, and placed under bell-glasses in a situation where there is a slight degree of bottom heat afforded them. The early spring season is the most generally suitable for this operation. When the cuttings are rooted, they should be potted singly into small pots of the same kind of soil already recommended, made rather more sandy than usual; the pots must be well drained. They should at first be placed in a close frame where there is a *very slight* degree of heat to start them afresh into growth, after which they should be gradually exposed to bear the atmospheric conditions of an ordinary greenhouse, and may take the ordinary treatment of young hardwooded greenhouse plants. Being in small pots, they should be kept well supplied with water; and should be transferred from time to time into larger pots, as their roots become numerous.

From the first, too, the young shoots should be frequently topped to produce a dwarf bushy habit.

ACCLIMATIZING.

So much unmeaning and speculative writing has been published on acclimatizing, that it is almost impossible to command attention to anything that touches on the subject. We have always repudiated the idea of making one degree difference in the capacity of a plant to exist in cold; and, although Sir Joseph Banks has written somewhat plainly on the subject, he has made a distinction between the plant itself and seedlings bred from the plant. It would be ridiculous to question the fact of seedlings being more hardy than the parent plant; every day's experience shows us that seedlings differ in some degree from the parent. Some flower earlier, some later: some are more hardy than others; but the capacity of the plant once settled, which it is as soon as it exists, nothing could make it live through a greater degree of cold than it would bear when it was first matured. Sir Joseph Banks took a right view of some portions of this subject. We agree with him that—

“Respectable and useful as every branch of the horticultural art certainly is, no one is more interesting to the public, or more likely to prove advantageous to those who may be so fortunate as to succeed in it, than that of *inuring plants, natives of warmer climates*, to bear, without covering, ungenial springs, chilly summers, and rigorous winters. He says, too—“Many attempts have been made in this line, and several valuable shrubs that used to be kept in our stoves, are now to be seen in the open garden; *there is, however, some reason to believe, that every one of these was originally the native of a cold climate*, though introduced to us through the medium of a warm one; as the gold tree, *Aucuba japonica*, the Moutan, *Pæonia frutescens*, and several others have been in our times.”

He says, too,—“In the case of annuals, however, it is probable that much has been done by our ancestors, and something by the present generation; but it must be remembered, that all that is required in the case of an annual, is to enable it to ripen its fruit in a comparatively cold summer, after which, we know that the hardest frost has no power to injure the seed, though exposed in the open air to its severest influence; but a perennial has to encounter with its buds and annual shoots frosts that have sometimes been so

severe with us, as to rend asunder the trunks of our indigenous forest trees."

Annuals are no more susceptible of change than perennials or biennials. The seedlings of anything and everything are more or less changed from the parent in some peculiarity. Therefore, what is attributed to annuals, may, with equal propriety, be attributed to all seedling plants. Nobody will dispute these changes. It might be years before any of these seedlings became more hardy: perhaps in some families they never would. The potato and dahlia seem as susceptible of injury from frost as ever; for though one may seem a little less injured than others on particular occasions, none have approached to what may be called hardy. We have no doubt that, if on the appearance of a plant that stood frost better than the rest, the seeds were perseveringly saved; and the same thing observed from time to time, a step in that path might frequently be gained; but there are hundreds of subjects which, though perpetuated by seeds from year to year, have not been noticed as to that one point, and therefore to this day are no better. Sir Joseph Banks gives one or two instances of plants becoming more robust after a few years' succession of seeds; but the conclusion must not always be drawn from first appearances: cause and effect should be more minutely examined. He says:—

"In the year 1791, some seeds of *Zizania aquatica* were procured from Canada, and sown in a pond at Spring Grove, near Hounslow; it grew, and produced strong plants, which ripened their seeds; those seeds vegetated in the succeeding spring, but the plants they produced were weak, slender, not half so tall as those of the first generation, and grew in the shallowest water only; the seeds of these plants produced others the next year, sensibly stronger than their parents of the second year.

"In this manner the plants proceeded, springing up every year from the seeds of the preceding one, every year becoming visibly stronger and larger, and rising from deeper parts of the pond, till the last year, 1804, when several of the plants were six feet in height, and the whole pond was in every part covered with them as thick as wheat grows on a well-managed field.

"Here we have an experiment which proves that an annual plant, scarce able to endure the ungenial summer of England, has become, in fourteen generations, as strong and as vigorous as our indigenous plants are, and as perfect in all its parts as in its native climate."

With great deference to Sir Joseph, we do not think there was any proof whatever that the plant was scarcely able to endure the summer, and has become, in fourteen generations,

as strong and as vigorous as our indigenous plants are, because, for all we can see, the plant was already so. The very first seeds that were sown, grew and produced strong plants, which ripened their seeds; therefore there was no indication of tenderness, nor is there anything extraordinary in the fact, that the seeds so ripened came up weaker than imported seeds, nor in their gradually improving. It is well to point out seed-saving and sowing as the only means of procuring from a tender plant a race of hardy ones; but it is a fallacy to look upon success as a matter of course. The offspring must be examined, and any single plant which stands frost better than the rest, should be alone saved from, because it is by trifling degrees that we can produce such changes, and, we fear, not to any great extent under any circumstances. The following does not say much either for the accuracy of the author's conclusions or the depth of his inquiries upon the subject; but the conclusion is the same as our own; for we insist that it is impossible to alter the constitution of a plant, though it is not impossible to raise new ones more hardy than the present. Sir Joseph says:—

"Some of our most common flowering shrubs have been long introduced into the gardens; the bay-tree has been cultivated more than two centuries; it is mentioned by Tusser, in the list of garden plants inserted in his book, called '*Five Hundred Points of Good Husbandry*,' printed in 1573.

"The laurel was introduced by Master Cole, a merchant, living at Hampstead, some years before 1629, when Parkinson published his '*Paradisus Terrestris*,' and at that time we had in our gardens, oranges, myrtles of three sorts, *laurustinus*, *cypress*, *Phillyrea*, *Alaternus*, *Arbutus*, a cactus brought from Bermuda, and the passion-flower, which last had flowered here, and showed a remarkable particularity, by rising from the ground near a month sooner if a seedling plant, than if it grew from roots brought from Virginia.

"*All these were at that time rather tender plants*; Master Cole cast a blanket over the top of his laurel, in frosty weather, to protect it; but though nearly two centuries have since elapsed, not one of them will yet bear with certainty our winter frosts.

"Though some of these shrubs ripen their seeds in this climate, it never has been, I believe, the custom of gardeners to sow them; some are propagated by suckers and cuttings, and others by imported seeds; consequently, the very identical laurel introduced by Master Cole, and some others of the plants enumerated by Parkinson, are now actually growing in our gardens; no wonder, then, that these original shrubs have not become hardier,

though probably they would have done so, had they passed through several generations by being raised from British seeds.

"Is it not, then, worthy a trial, *as we find that plants raised from suckers or cuttings do not grow hardier by time*, and as the experiment on *Zizania* points out the road, to sow the seeds of these and such like tender shrubs as occasionally ripen them in this climate? Fourteen generations, in the case of the *Zizania*, produced a complete habit of succeeding in this climate, but a considerable improvement in hardiness was evident much earlier."

This is not quite so clear and intelligible as it was meant to be; and while we agree with the author as to his conclusions, we deny that he has at all made out a case with regard to the *Zizania*; for it grew and ripened seeds the first year, and it did no more at the end of the fourteen. Sir Joseph Banks is an additional authority for our conclusion, that it is impossible to acclimatize plants; and all the writers who assert the contrary, expose their ignorance of the science they profess to advance. There is only one course—the originating new races from the seed.

THE PROGRESS OF FLORICULTURE.

THE progress of floriculture during the year 1848 has been greatly retarded by a number of circumstances that tend to lower the standard by which flowers are judged, and we can hardly imagine anything more likely to retrograde, than a continuance of that carelessness of results, which has been manifested by those who take the lead in such matters. The circumstances to which we allude are, first, the abandonment of second-class prizes, the effect of which has been that judges have been obliged to reject good second-class flowers altogether, or give them first-class prizes, and have chosen the latter; second, a carelessness in the appointment of judges at horticultural shows, by which the proper fate of many subjects submitted for exhibition has been reversed; third, an inordinate desire to put out a certain number of new subjects every season, instead of confining the novelties to things really in advance of the present varieties; fourth, a decided and persevering endeavour to counteract the prevalent disposition of the public to select flowers according to the properties which are acknowledged by the best judges to constitute perfection. We will explain these causes in rotation. First, the abandonment of second-class prizes, which ought to have had the best possible effect, and was originally determined upon to raise the quality, has failed, only because the judges have not had nerve enough to carry out the object properly. The intention of those who abandoned second-class prizes was to discourage second-class flowers, and for a time the effect was good. The hopelessness of obtaining a prize deterred people from bringing them, and as the public sought only first-rate novelties, there was no sale for any other. We soon observed, however, that the raisers of flowers who happened to have nothing first-rate, and half-a-dozen or more very fair second-rate ones, were annoyed if they had no prize; and, considering that it made fifty or a hundred pounds difference in the value of a flower, it is not to be wondered at. Yet it was the only way to keep up the high price of novel-

ties. We foresaw that the instant the raisers could make head against the new movement, there would be a change, because the properties that constitute perfection, and the blemishes which excluded a novelty, rendered first-class flowers few in number, and none others would sell. To lower the standard, then, was the only way to get over it, and this has unfortunately been done, though not nominally. Among the means adopted to accomplish this, the most powerful was a reduction of the number of flowers required as a test. In dahlias there is no dependence the first year, consequently they are grown a second season to prove them; and as all raisers, when they grow them a second year, plant out twenty or thirty plants, it was considered by the leaders in the adverse movement that not less than six blooms should be exhibited. This alone was a great protection to the public, because, independently of any merit in the flower as to form, colour, and symmetry, there must be some chance of getting a flower when half-a-dozen are shown. In the struggle to advance on the part of the true florist, and to retrograde on the part of the less scrupulous dealers, the latter have for the moment got the upper hand, and last year the test applied to flowers, of which, as we have already said, few plant out less than thirty, was reduced to half the number. What was the consequence? Why, that fifty varieties that could not have been exhibited at all while the test required six, were shown for prizes, and never will be shown again, by reason of their uncertainty, or, if shown, will give a bloom by accident; for it must be conceded, that if six flowers cannot be produced from thirty well-grown plants at any part of the season, the uncertainty is too great to justify letting the variety out at all. In consequence, therefore, of only showing three blooms, fifty or more that would not yield half-a-dozen specimens, were not only produced to compete with the few that would, but actually obtained prizes. It was worthy of remark, too, that the prevailing fault was imperfection in the eye and

general centre of the flower, than which nothing can be worse, and we need hardly say that if three blooms could not be obtained with perfect centres, a variety should not by any means be noticed at all. But the judges, seeing more seedlings shown than ever had been seen at once before, felt that they must award a few prizes, and so they did, but in vain might they have looked for any that deserved such notice. There were very few that came up to mediocrity, none that passed it. The show at which these novelties were exhibited, was entirely influenced by the growers, and there were many first-class prizes awarded to flowers that will rarely be seen in a stand, and if they are, they will disparage it. What we are now saying of the Dahlia applies to every other flower, and we select this particular subject, chiefly on account of its popularity and dearness, for although it is grown less generally than it was at one time, there are still some thousands of pounds change hands every year. The public will this year, or rather next year, have a hundred-and-fifty varieties called new, and charged for as new, with such tempting descriptions that enthusiasts will be puzzled to select the best, and if they were to buy and grow all, the chances are that they would not retain half-a-dozen, certainly not a dozen, the second year. Of those which have had prizes at the different shows, very little that is at all favourable can be said of them; there are, in fact, better flowers that have had no such distinction. Perhaps no year has been distinguished less by distinct novelty, but we would rather see an old favourite beat in form than a distinct novelty less perfect; yet a decided novel colour is an excuse for a second-rate form, until we can get a better. The style of flower approaching Keyne's Standard of Perfection is certainly on the increase, but the worst of it is, so many of them are deficient in the eye, and that is a fault from which the Standard itself is not exempt, and it goes a long way towards making it uncertain. The time has come when nothing worse than that among cupped flowers, and nothing worse than Princess Radziwill as a reflexed flower, should be deemed first-rate, or have a first-class prize. It has the worst possible effect on the general interests, though it may for a time help individuals to pass off indifferent varieties as worthy of notice. It may tell a little in present receipts, but must operate against the future; besides which, it inundates the gardens with subjects of a lower quality, and the seedlings from them are less likely to advance. The public eye, too, will get familiar with inferior forms of flowers, reconciled to a lower class of productions. Doubtless, if there had been second-class prizes to give to second-class flowers, many

that have now had first would have had second; but there being no such distinction, the judges, calculating on the fact that the more prizes they give the more growers they please, and having no choice but to give first-class certificates or none, err always on the liberal side as to quantity, though too often they also err in selection, by trying to distinguish particular varieties among scores that are all bad alike. Under these circumstances, it is clear that the abandonment of second-class prizes for new flowers is an evil that is rapidly extending itself, simply because the judges, having in general no character to support as judges, act good-naturedly, and if appointed from among dealers, injudiciously award undeserved certificates of merit, for—

“A fellow feeling makes us wondrous kind.”

The abandonment of second-class prizes, without the firmness to refuse prizes altogether, is exemplified by the growers themselves, who even this year are advertizing flowers that obtained first-class prizes, at a second-class price. This is honest on their part, but it is a sad rebuke on the judges who could so far forget themselves, or were so unqualified for the task, as to give to a flower an artificial value, that even the owner is ashamed to take advantage of. And this leads us to the second cause of the progress of floriculture being retarded; carelessness in the appointment of judges at horticultural shows. This is, perhaps, the greatest evil that floriculture labours under. It is not only necessary that men should be qualified for the office, but they should not be dealers, that they may have to care “who wins and who loses,” nor be dependent on the caprice or fancy of any body. The most gross partiality is exercised at many shows; the dealer helps up his best customer, and the best customer helps the dealer as almost a matter of course, whenever judges are appointed by the exhibitors themselves. It is not our business here to mention names, but at a show held in London, or rather in the metropolis, in September, there was the most unblushing, unjustifiable, and palpable injustice done in several classes and sweepstakes, that the oldest adept in floriculture ever saw. Our business, however, is only with general principles, not people. Judges ought to be known as such, paid as such, and be responsible as such; men who have some reputation as judges, and, above all, not dealers, nor dependent on dealers. Good gardeners are not necessarily good judges. A man may have his particular notions and partialities warped a good deal by the nature of the place he fills, but a judge should be altogether above this. He should be accustomed to exhibitions, and not a mere grower of par-

ticular plants. He should be engaged, and paid, and known to every exhibitor from the first; he then has a reputation to sustain, which is a sort of security against any improper decisions. The reverse of all this has been fatal to the interests of floriculture. In some cases, judges are not thought of until the productions are all ready for their decision. They are then hastily appointed by the exhibitors from persons on the spot, people who are known growers or otherwise as the case may be, but perhaps unacquainted with half the subjects on show. These gentlemen are very frequently there on purpose to be chosen, and some shower ready to propose them; and they have no standing in the Society as judges, no credit to uphold in a decision, that is given, and done with, and forgotten, with all its faults, except by the parties who are wronged. This is the case with a great majority of shows, and those at which there are paid judges are not so well managed as they might be. It is an enormous evil to employ dealers; the temptations are greater than many people can bear. A dealer sees something that he fancies, and buys. His first step is to get the owner to show it where he is judge. Whether it be really good or not, he does not give up its claim to a prize without a hard fight, and it is a very common occurrence for the very man that has given a prize to be the owner of the plant so distinguished. The past year has been prolific of prizes, without having been productive of a corresponding number of good flowers, and all arising out of the carelessness of the arrangements for judges. The third cause of a sort of retrograde movement in the progress of floriculture, we have said arises from the desire of dealers to send out a certain number of flowers every year, and they rather make up the number with bad than not send out their quantity. Let us go to the Dahlia trade as an example, although the dealers in Pansies, Fuchsias, Verbenas, and other flowers, would do just as well. On looking to the advertisements of a number every year, we find from two to ten, according to a man's connexion, always advertized; some years they have one or two good ones among them, sometimes none, but they are always "first-rate." This year more than one hundred are "warranted show flowers," "warranted first-rate," and others strongly recommended, and as elaborately described. For many years past, every season has produced its hundred or two of half-guinea varieties, and yet, with all the advantage of a quarter of a century's established favourites, it would be difficult to find a dozen flowers as good as Princess Radziwill, or the Standard of Perfection.

When any one splendid flower came to the share of a grower who was aware of its importance, he was enabled to get four or five hundred pounds for the produce, and any advance or distinguished novelty, well authenticated, would bring the money now; but there is not a grower who has not warranted things over and over again to be first-rate, when they have disappointed the buyer, and the public have ceased to believe one word they read in the catalogues of dealers, or the papers of the day, simply because the papers of the day, being dependant on the advertisements of the dealers, are but the echo of their words. Not that the proprietors of newspapers care one way or the other, but that the persons employed to go among the dealers are influenced by the people they associate with, and have not the firmness or the judgment to act on their own opinion. But, without meaning any disrespect to the gentlemen of the press, we should like to know if there be a single instance of a paper or periodical connected with floriculture, that is to say, florist's flowers, that is not, more or less, actually conducted by or influenced by dealers. The *Midland Florist* by Mr. Wood, florist, of Nottingham; the *Gardeners' Journal* by Mr. Dickson, florist, of Clapham; the *Cabinet* by Mr. Harrison, nurseryman, of Downham; the *Florist* by Mr. Beck, florist, of Isleworth; the *Gardener* by Mr. Neville, florist, of Peckham; and this runs the gauntlet of the floral publications, except the *Gardeners' Chronicle* and ourselves, and we need not say that we are independent of dealers. We have never been indebted to a florist for an opinion on flowers; we have always used our own judgment, or resorted to that of Mr. Glenny. We know our own opinion has never been influenced, and we believe Mr. Glenny's has not been. He has never exhibited much sign of dependence, or even a wish to oblige. We wish he were sometimes a little more considerate than he appears to be, for even an honest opinion may be given without being offensive. While upon this subject, we may as well observe that Mr. Glenny is engaged to supply us next year with a monthly summary of all that goes on in the floral world,—his opinion of all the new flowers worth notice; and this paper must stand upon its own merits; we shall be perfectly uninfluenced even by him. He has been long enough before the gardening world to stand or fall by his own opinions, and as the author of the *Properties of Flowers*, we presume he is as good a judge as we can engage, to let our readers know from time to time the names and descriptions of the best new subjects.

*Trichomanes radicans* var. *Andrewsii*.

CULTURE OF HARDY FERNS.

An intelligent modern writer thus expresses himself:—"If any pleasure can be called bright, beautiful, and lasting, it surely is a love of nature, particularly of the green things that clothe the earth's surface. The contemplation of them gives a tone of health and freshness to the mind, and the culture of them vigour to the body." In accordance with this sentiment, we must claim for the family of ferns a larger share than they have hitherto received of that attention which is so freely accorded, by almost every class, to the culture of ornamental plants. In doing this, we can hardly claim the merit of leading the public taste; for, in fact, a tendency in the direction we desire to point, has already manifested itself. This tendency we would by all means encourage, under the full persuasion that the writer above quoted has touched the very key-string of healthful recreation, and innocent though engrossing enjoyment. It is true that ferns are not attractive and captivating from any gaudiness that they possess: indeed, on the contrary, it is their very simplicity which gains them their admirers. Devoid of painted blossoms, they wear only the cheerful tints of "nature's livery," varied as it is through the many shades which intervene between the bright and transparent, and the deeply-saturated and opaque. It is in their forms, however, that the ferns, as it were, command admiration: here they are unapproachable. No form that art can devise, can for a moment be compared, for grace and elegance, to nature's models, as displayed in the vegetable world; and no other department of the vegetable world can compare, in this respect, with the unblossoming ferns. Even the common bracken which clothes immense tracts of the uncultivated wastes of this country, and in this condition is, perhaps, one of the least beautiful of its race, is superlatively elegant under circumstances more

favourable to its full development. We have ourselves seen this common and despised plant growing from the hedge-banks on either side of a damp shady lane, towering far above the heads of the passers-by, and waving its broad feathery fronds in the gently-agitating breeze; and we have been riveted to the spot, entranced in admiration of its wildly-luxuriant elegance and extreme gracefulness. And so it is with many others. There is the lady-fern, which has, indeed, been styled the queen of ferns, and described as being "exquisitely and super-eminently beautiful:"

"Her texture as frail as though shiv'ring with fright."

This, placed under circumstances favourable to its full development, becomes one of the most lovely of its race, its texture transparent, its composition extremely light, feathery, and compound, and its whole form drooping in varied curves, each a "line of beauty." These examples are from the *wild ferns* of our native country, where, indeed, many others, hardly giving place to them in beauty—if, indeed, they do not exceed them in some respects—may be met with. We have purposely alluded to *them* for this very reason, because they are within the means of all, from the peer downwards to the cottager;—ay, and not confined to the mature of either rank, but accessible even to children, in whom it were well to foster a taste for garden exercise, and to whom no group of ornamental plants may be so strongly recommended as those under notice.

"Ferns," says another writer,—and we must quote his happy remark,—"*ferns* constitute so beautiful a portion of the creation, whether they ornament our ruins with their light and graceful foliage, wave their bright tresses from our weather-beaten rocks, or clothe with evergreen verdure our forests or our hedgerows,—that it seems next to im-

possible to behold them without experiencing emotions of pleasure." Those who have paid any attention to ferns, will at once recognise in this an expression of their own feelings; and those who have not, we hope to start on the pleasing track.

For the present, we confine our remarks to that group of hardy ferns which are indigenous to the United Kingdom. Even among this little group, consisting of upwards of fifty kinds, including within the species some well-marked varieties, there is considerable diversity, amply sufficient to render a collection of the more accessible kinds a feature of deep interest, either in a large or small garden. We must not forget to remind those who live in densely-populated neighbourhoods, and sigh almost in vain for any green thing about their dwellings, that ferns are just the very subjects for them. Even in the heart of London, and in the most confined districts of that metropolis, ferns are cultivated with full success.—"Ay, but at an enormous outlay," some longing admirer of vegetation may exclaim. Not at all so. Nothing very expensive is essential; expense may be incurred for ornament's sake, but this is beside the question. All that is required is comprised in this brief enumeration:—A few logs of rough, broken, otherwise useless stone, a little soil, and a close covering of glass, which latter, though the most costly item, is not at the present day so much so, as to place it beyond the reach of thousands who are by atmospheric circumstances prevented from indulging in any other species of garden culture. Besides, such a structure may be of any size, from that of a common handlight—just space enough for two or three little ferns—to that of a good-sized greenhouse, capable of containing, not only all the indigenous species, but others of exotic origin. Mr. Ward—after whom the contrivances, known sometimes as Wardian cases, and sometimes as window-greenhouses, are named—has for many years cultivated ferns in the centre of London, in the way here alluded to, the essentials of which are a close glass covering to exclude the impure atmosphere, a shady situation, or artificial shade; a rough surface such as is afforded by rock-work, to which to fix the plants, and an occasional supply of water; this latter is not, however, often necessary, the close construction of the case preventing rapid loss by evaporation.

On the subject of the wild ferns of Britain, a little book* has lately fallen into our hands, which we strongly recommend as supplying

a most complete and interesting description of all the species and varieties which are known to have been found in the three kingdoms. Some of them are very common and abundantly distributed, and others very rare and local. We shall glance through this "Hand-book," and select a few passages which go to illustrate our subject, first of all remarking, that the book itself is of a convenient size for the pocket, the descriptions of the plants are full, precise, and plain, the illustrations—of which there are upwards of fifty, (some of which, by the courtesy of the author, we are enabled to introduce in illustration of this article)—very faithful; and the analytical tables introduced for the purpose of facilitating the discrimination of the genera and species on the part of learners exceedingly clear and explicit. In the introductory portion we are told, that—

"The cultivation of ferns is a growing fancy, and one which deserves to be fostered and encouraged; for, whoever admires ferns, must be a lover of nature. Their simple and ungaudy elegance—superlative though it be—has nothing in it to attract those whose eyes can feast only on the pageantry of floriculture. A man may admire and esteem a flower for some characteristic which excludes nature altogether from any share of that esteem; but nature and ferns are, as it were, inseparable; and there is, therefore, no group of vegetation, the culture of which is so peculiarly adapted as this, to

'Lead through Nature up to Nature's God.'

Then follow some chapters on the structure of these plants, in which they are defined as belonging to a group of the flowerless plants, in which stems and leaves are distinguishable, and as consisting of a caudex or stem, from which issue the roots and leaf-like fronds, the latter bearing the reproductive organs or spores, in some cases on their edge, and in others at their back. Thus a fern may be divided externally into four parts, the root, the caudex, the frond, and the fructification. These parts are described at some length; a portion of the description of the frond—which, by the by, the uninitiated would be apt to call the leaf—we select for extract:—

"The *frond* is the most conspicuous portion of ferns, and that for the sake of which the plants are cultivated. Issuing from the caudex, which is a true stem, they are in some measure analogous to the leaves of other plants; and, in consequence, the term *frond* has, by some, been objected to as unnecessary,

* A Handbook of British Ferns: intended as a guide and companion in Fern Culture; and comprising scientific and popular descriptions, with engravings of all the species indigenous to Britain, with remarks on their history and cultivation. By Thomas

Moore, Curator of the Botanic Garden of the Society of Apothecaries, Chelsea. London: R. Groombridge & Sons, Paternoster Row; and W. Pamplin, Frith Street, Soho.

and that of leaf employed in its stead. The peculiar manner, however, in which the fructification is borne on this part of the plant, seems to render it desirable to maintain the distinctive name of frond, which, also, is very generally adopted,—a still further reason for its continuance. An analogy has been traced between these fronds and the deciduous branches of other plants.

“ In their undeveloped state, the fronds of the greater number of the species of ferns are coiled up inwards towards the axis of development, forming a series of convoluted curves. The folding up of the frond of ferns, as of the leaves of other plants, is termed their *vernation*; and the peculiar form of vernation which is most general among ferns, and in which the undeveloped parts are rolled inwards, or bent like the head of a crozier, is said to be *circinate*. The only British species which differ from this in the mode of their vernation, are the *Botrychium*, and the *Ophioglossum*; and in these the young parts, instead of being rolled up, are folded straight. As the fronds become developed, these parts gradually unfold, the more compound of the circinate species being in most cases seen to have the divisions of the frond also rolled up in a similar manner; in this case, the larger divisions first open, and afterwards, in order, the *pinnæ*, *pinnules*, and lobes. In many of the species the partially developed fronds have a very graceful appearance. As the fronds become developed, two parts become distinguishable. At the base, more or less extending upwards, is a leafless portion, which is called the *stipes* or stalk by some, and the stem by others; the latter term, however, more properly belongs to the caudex, and is therefore objectionable as applied to any part of the frond. Upon the lower part of the stipes generally, and sometimes throughout the entire length of the rachis, is found a more or less dense covering of paleaceous or membranous scales; in some cases, this is confined to a few small scattered scales near the base of the stipes, but in the other cases they are so large and numerous as to produce quite a shaggy character. They are most generally regarded as portions of disrupted epidermis, occasioned by the pressure of the sap beneath. Whatever their origin, they are to be regarded as special organs, being very constant in their appearance and development in the same species. The upper portion of the frond, extending more or less downwards, is leafy, and through this leafy portion the substance of the stipes is continued onwards to the apex of the frond, being, however, distinguished in this upper portion by the term rachis.

The leafy portion of the frond offers many states of division, the parts being much in-

fluenced in size and number by external circumstances. Sometimes it is simple or undivided; sometimes *pinnatifid*, or more or less deeply cleft; sometimes *pinnate*, or divided into distinct leaf-like divisions, or *pinnæ*; sometimes *bipinnate*, when the *pinnæ* are themselves *pinnate*,—occasionally the *pinnæ* are only *pinnatifid*, or deeply cleft,—this second series of *pinnæ* being called *pinnules*; sometimes the fronds are still more compoundly divided, the *pinnules* being either *pinnatifid*, or again *pinnate*. The character of the division of the frond is much employed in distinguishing the species.”

Respecting the geographical distribution of ferns, we are told—

“ The proportion which the ferns bear to the phænogamous portion of the Flora of the British Isles, may be taken in round numbers as one to thirty-five. In Scotland they are computed to hold the proportion of one in thirty-one. There is an enormous disproportion between the ferns and the rest of the Flora in certain tropical islands. Thus, in Jamaica, they are one-ninth of the phænogamous plants; in New Guinea, D'Urville found them to bear the proportion of 28 to 122; in New Ireland, they are as 13 to 60; and in the Sandwich Isles, as 40 to 160. Ferns form a very important feature in the vegetation of the Indian Archipelago. Upon the continent they are found to be less numerous; thus, in equinoctial America, Humboldt does not state them higher than 1-36th; and in New Holland, Brown finds them 1-37th. They decrease in proportion towards each pole, so that in France they stand as 1-63d, in Portugal as 1-116th, in the Greek Archipelago as 1-227th; and in Egypt as 1-971st of the flowering plants. Northwards of these countries their proportion again augments, and they are found to form 1-31st of the phænogamous vegetation of Scotland, 1-35th in Sweden, 1-18th in Iceland, 1-10th in Greenland, and 1-7th at North Cape.”

We shall now select at random from the body of the work a few of the engravings and descriptions, as specimens of the matter and illustrations:—

“ GENUS XIV. *TRICHOMANES*, *Linnaeus*.—Fronds pellucid; veins prominent, branched, either ending at or within the margin, or extended free into a filiform receptacle, around which the spore cases are attached within an elongated cup-shaped involucre of the same texture as the frond; receptacle more or less exserted. Name derived from the Greek *trichos* (a hair), and *mania* (excess), in reference to the exserted hair-like receptacles.

“ 1. *Trichomanes radicans*, Swartz (Bristle Fern); fronds 3-4 *pinnatifid*, pendulous, angular-ovate, glabrous; segments linear entire, or

obtusely bifid ; involucre cylindrical, scarcely two-lipped, solitary in the axils of the upper segments, more or less winged ; receptacles filiform, exserted.—DESC. : *Trichomanes radicans*, Swartz. Hook. Species Filicum, i. 125.



Trichomanes radicans.

Bab. Manual, 2 ed. 415. *Trichomanes speciosum*, Willdenow. Newm. Brit. Ferns, 2 ed. 305. *Trichomanes brevisetum*, R. Br. Sm. Eng. Fl. iv. 311. Hook. Brit. Fl. 5 ed. 445. Franc. Anal. 3 ed. 62. *Trichomanes alatum*, Hook. Fl. Lond. *Trichomanes europæum*, Smith. *Hymenophyllum alatum*, Smith. *Didymoglossum alatum*, Desvaux.—FIG : Newm. 305. Eng. Bot. 1417. Franc. pl. 6, fig. 6.

“*β. Andrewsii*; fronds drooping-lanceolate, lower pinnæ distant, short, involucre immersed, receptacles long curved upwards. Desc: Newm. Ferns, 2 ed. 318. Bab. Manual. 2 ed. 415. *Trichomanes Andrewsii*, Newm. p. 14. FIG : Newm. 315.

“The Bristle Fern—one of the most rare and delicate of all our native species—has an elongated creeping caudex which, as well as the branching roots, are dark-coloured, and clothed with small thick-set narrow articulated scales or bristles, thus acquiring a downy surface, which is less apparent in the variety *Andrewsii*, than in the more usual state of the plant. The fronds, as has been well remarked, consist of hard wiry-branched ribs or veins, each furnished throughout with a semi-membranous pellucid wing, the wings, in fact, forming the leafy portion of the frond ; their shape is variable, from angular-ovate, approaching triangular, to oblong-acuminate or lanceolate, the latter being the form of those of the variety *Andrewsii* ; they spring up solitary here and there from the caudex as it becomes extended over the damp surface of the rocks, and are three years arriving at a mature condition ; the young ones being formed about May, attaining their full development in the

second autumn, and becoming fruitful in the autumn of the third year, after which they show symptoms of decay ; the barren fronds, however, retain their freshness in moist situations for many years. The stipes are sometimes less than one-fourth the length of the leafy portion of the frond, and in others equally long ; it is winged throughout with a narrow border. The fronds, which are circinate in venation, are usually thrice pinnatifid ; the primary divisions, which are ovato-lanceolate and alternate, almost become pinnæ ; the secondary lobes are broadly or narrowly ovate, according to their position, and the ultimate divisions are narrow linear, in some cases entire, and in others obtusely bifid. The whole of the leafy part of the frond is of a semi-transparent cellular texture, and is seen, when slightly magnified, to be elegantly reticulated. The veins may be compared to wiry ribs branching and extending through all the divisions of the frond ; in the barren parts these terminate at or within the apex of the ultimate lobes ; but where the fructification is produced, they become elongated beyond the margin, the free portion being surrounded at the base, where they are encircled by the spore cases, by a monophyllous, or elongate cup-shaped involucre, and becoming more or less lengthened beyond the involucre ; the latter either projects beyond the margin, as in the ordinary plant, or is, as it were, immersed in the substance of the frond, as in *Andrewsii*. The veins of the fronds have been already (p. 3.) described as the receptacles ; the veins, which in this plant are elongated beyond the margin bearing the fructification, are hence the receptacles ; and it is around the base of these, which is covered by the involucre, that the spore cases are clustered. The degree of the elongation of the receptacle is very variable ; sometimes it projects but slightly, and at other times is two or three times as long in the involucre ; in the variety *Andrewsii* they are five, and even six times as long as the involucre, and curve up from the surface of the fronds in a very conspicuous manner. The fructification becomes mature in the autumn.

“Neither the species nor variety are certainly known to exist in a wild state in the United Kingdom, elsewhere than in Ireland, where both are found sparingly, in several localities, attached to dripping rocks and the walls of damp caves, in shaded glens, and the vicinity of waterfalls ; it is also found in some of the warmer parts of Europe, in Asia, and in both Americas.”

The Lady Fern, already alluded to in these remarks, is thus described :—

“GENUS VII. *ATHYRIUM*, Roth.—Mid-vein distinct, lateral veins branched free ; sori

semilunate indusiate, placed on the side of the lateral veins; indusium oblong-reniform, opening longitudinally towards the mid-vein, the free margin fringed with capillary segments. Name derived from the Greek *athyros* (opened), in allusion to the mode of dehiscence of the indusium, which at length becomes elevated along one of its margins, opening like a door, so as not to enclose the spore cases.

"This genus was constituted by Roth, for the reception of our indigenous Lady Fern, which, from 'the exquisite grace of its habit, the elegance of its cutting, and the brilliant delicacy of its colour,' claims precedence in beauty over every other British species. Roth's genus is not universally adopted, the species being by some still retained under *Asplenium*.



Athyrium Filix-femina.

"1. *Athyrium Filix-femina*, Roth (Lady Fern); Frond lanceolate bipinnate; pinnae linear-lanceolate; pinnules linear-oblong, deeply serrate or pinnatifid.—DESC: *Athyrium Filix-femina*, Roth. Newm. Brit. Ferns, 2 ed. 237. Bab. Manual. 2 ed. 413. *Asplenium Filix-femina*, Bernhardt. Hook. Brit. Fl. 5 ed. 443. Franc. Anal. 3 ed. 50. *Aspidium Filix-femina*, Swartz. Sm. Eng. Fl. iv. 282. *Polypodium Filix-femina*, Linnæus.—FIG: Newm. 237. Franc. pl. 5, fig. 4. Eng. Bot. 1459 (bad).—A very variable species, as regards size, outline, division, and density.

The following forms, several of which are by some regarded as species, may be distinguished as varieties:—

"*a. incisum*; fronds broadly lanceolate, drooping; pinnules linear, or ovate-lanceolate, distinct, deeply pinnatifid, with flat diverging sharply-toothed lobes; sori distinct.—DESC: Newm. Brit. Ferns, 2 ed. 243. Bab. Manual, 2 ed. 413. *Athyrium Filix-femina*, Roth. *Polypodium incisum*, Hoffman.—FIG: Newm. 243.—Of this form I have examples gathered near Guildford, Surrey, the pinnae and pinnules of which are large, broad, and close set, the whole frond appearing densely leafy.

"*β. convexum*; fronds linear-lanceolate, semi-erect; pinnules distinct, very narrow, linear, convex with deflexed margins, bluntly toothed; sori confluent.—DESC: Bab. Manual, 1 ed. 388. Newm. Brit. Ferns, 2 ed. 245. *Athyrium rheticum*, Roth. *Polypodium rheticum*, Linnæus.—FIG: A seedling, or starved form of this variety (*Aspidium irriguum*, Smith; *Athyrium rheticum minus*, Roth,) is represented in Newm. Brit. Ferns, 245.

"*γ. trifidum*; fronds ovate-lanceolate, semi-erect; pinnules linear-lanceolate, sub-decurrent, flat, deeply cut, the apices of the lobes generally trifid.—DESC: Newm. Brit. Ferns 2 ed. 242. *Athyrium trifidum*, Roth. *Polypodium trifidum*, Hoffman.

"*δ. molle*; fronds ovate-lanceolate, semi-erect; lower pair of pinnae distant, short, deflexed; pinnules lanceolate, decurrent, united by wing of mid-rib, flat, toothed; sori distinct.—DESC: Newm. Brit. Ferns, 2 ed. 242. Bab. Manual, 2 ed. 413. *Athyrium molle*, Roth. *Polypodium molle*, Schreber.

"*ε. multifidum*; fronds semi-erect, lanceolate; pinnae narrow lanceolate, their apex as well as the apex of the frond multifid or tasseled; sori crowded.—DESC: *Athyrium Filix-femina vivipara*, Steele, Handb. Field Bot. 215. FIG: Newm. 248.—A very curious and elegant monstrosity, retaining its peculiar characters under cultivation. Found in Ireland, where two forms, slightly differing, but possessing the same general characters, have been met with by Mr. J. T. Mackay, and Mr. D. Moore.

"*ζ. crispum*; dwarf, (six to eight inches,) slender, delicate, crisped; rachis variously forked, the apex of the divisions densely tufted or tasseled; barren. A very distinct form, discovered by Mr. A. Smith on the hill Orah, in the county Antrim, Ireland; it proves constant under cultivation, and much resembles a tuft of curled parsley.

"Mr. Dickie has favoured me with a singular monstrosity, apparently referable to this species, but very different from either of the preceding forms. In this the pinnules are developed in a very irregular degree, their

margins being irregularly lacerated. It was found in 1846 on Ben Muich Dhui in Aberdeenshire, at 2,700 feet elevation, and has maintained the same appearance under cultivation.

"The Lady Fern grows with a tufted caudex, which in old plants of the stronger growing variety, *incisum*, becomes considerably elongated and trunk-like; from this the black wiry fibrous roots are produced. The fronds are in all cases of delicate texture, and have more or less of a light feathery appearance; they grow up about May, reaching maturity towards the end of the summer, and dying down in the autumn if not destroyed by early frost; their vernation at first is circinate, but by degrees the apex becomes liberated, and hangs down, assuming the appearance of a shepherd's crook, as in *Lastrea Filix-mas*. The general outline of the frond is lanceolate, broadest in the variety *incisum*, and narrowest in *convexum*: *incisum* often grows four or five feet high; *trifidum*, *convexum*, and *multifidum* from two to three feet; *molle* from a foot to eighteen inches; and *crispum* usually about six inches high. The fronds grow up in a large tuft from the crown, the older plants of the larger varieties sometimes throwing up from twenty to thirty fronds, such examples being noble as well as lovely; *incisum* has the fronds somewhat drooping; the others, with the exception of *crispum*, are more erect in habit; *crispum* is of a spreading



Athyrium Filix-femina crispum.

tufted habit of growth. The stipes is surrounded with numerous elongated scales around the base, where it is much swollen, a few smaller scales occurring on the upper part;

on the lower part, from a fourth to a third of the height of the plant, the stipes are bare of pinnae; in the upper part the pinnae are closer or more distant, varying much according to the situation where the plant has been growing. The pinnae are lanceolate, more or less attenuated; they are distinctly pinnate in *incisum* and *convexum*, the pinnules becoming somewhat decurrent in *trifidum*, and more decidedly so in *molle*. The pinnules have more or less of the lanceolate form; those of *incisum* are flat, deeply pinnatifid, with diverging sharply-toothed lobes; of *convexum* linear, convolute, the margins being notched rather than toothed, and folding over the sori; of *trifidum* flat, deeply cut, the apices of the lobes generally distinctly trifid, and the first anterior lobe larger than the rest; of *molle* flat with toothed margins. The venation is mostly very distinct, from the delicate texture of the frond; its general character is—mid-vein waved, lateral veins forked shortly after leaving the mid-vein, the anterior branch bearing on its side the oblong sorus, about equi-distant from the mid-vein and margin; the other branch becoming forked or not, according to the composition of the frond, one branch extending to each serrature: in the larger and more divided pinnules the lateral veins branch alternately, and bear more than one sorus. The sori are elongate-reniform, or somewhat sausage-shaped, covered with an indusium of the same form, opening towards the mid-vein, its free margin split into narrow segments. Smith remarks that the sori finally become nearly round, and the indusium orbicular, with a notch at the base, thus assuming in this stage the character of an *Aspidium*, to which genus he referred the plant. In *incisum*, *trifidum*, and *molle*, the sori are usually distinct; in *convexum* and *multifidum* confluent. The fructification is mature about September.

"The species is abundant in most parts of Britain, and particularly so in Ireland; and no doubt the varieties *incisum*, *convexum*, *trifidum*, and *molle*, are pretty generally distributed, though there appear to be no statistics on this point. The other varieties or monstrosities are, I believe, only found in Ireland. Warm and moist woods and hedge-row banks are the favourite localities of this species, but it is not confined to such situations, although in them it attains its greatest vigour and luxuriance. It also occurs throughout Europe, in Asia, Africa, and North America.

"This species does not appear to be applied to any special use, except that in Ireland, where it abounds on all the bogs, it is employed as a packing material for fish and fruit, as the common bracken is in this country.

"There is no difficulty in the cultivation of this very beautiful plant. If planted about rockwork it should occupy a low boggy situation at the foot of the rock, being planted amongst turfy soil, kept well moistened either naturally or artificially. It is far less beautiful if planted in dry exposed situations. No object about a piece of rockwork is so beautiful as a vigorous plant of the Lady Fern, placed just within the mouth of a dark cavernous recess, large enough to admit of its development, and just open enough that the light of day may gleam across the dark background of the cavern, revealing the drooping feathery fronds. In such a situation it will grow freely, provided there is a sufficient supply of moisture to its roots. For planting in shady woods, or on the margin of ornamental water, no fern can be more appropriate or beautiful. If grown in a pot, it must have a large sized one, and should be placed in rough turfy soil, which should be intermixed with lumps of charcoal and freestone, or potsherds. To attain anything like a fair degree of development, the plants must be kept well supplied with water.

"'The Lady Fern,' writes Mr. Lees in the *Botanical Looker-Out*, 'is the queen of ferns, exquisitely and super-eminently delicate and beautiful;' and he adds some stanzas, one or two of which I must here quote:—

"'By the fountain I saw her, just sprung into sight,
Her texture as frail as tho' shivering with fright;
To the water she shrinks—I can scarcely discern
In the deep humid shadows the soft Lady Fern.

"'Where the water is pouring for ever she sits,
And beside her the Ouzel and Kingfisher flits;
There supreme in her beauty, beside the full urn,
In the shade of the rocks stands the tall Lady Fern,'"



Botrychium Lunaria.

Some of the ferns are of considerable economic value. Thus the *Pteris aquilina*, or common bracken, already alluded to as assuming under certain conditions an exceedingly graceful appearance, is applied to various uses. "The underground succulent stems abound in starch, and, as stated by Lightfoot, have been used in different countries as an ingredient in making a miserable kind of bread; they have also been employed in brewing ale in the proportion of one-third to two-thirds malt. Mr. A. Forsyth obtained a substance like coarse brown flour, by grating the clean-washed stems, washing the pulp, and straining it through a fine wire sieve. By first scraping off the brown outer coating, white fecula was obtained, which, when boiled, had no disagreeable taste. The fecula, he says, may be easily converted into malt, and, mixed with a very small quantity of real malt, will produce good beer. Both the underground stems in winter, and the tender shoots in May, make, when boiled, a very nutritious article of food for pigs, but it is not proper for young ones. The young succulent fronds, also, make an excellent green manure, if cut and dried, or ploughed in immediately. The dried fronds form a very durable thatch, for which purpose they should be pulled up in October, when perfectly pliant; they are besides valuable as litter, and even sometimes mixed with hay, as food for cattle; and are one of the best of all protecting materials in gardens, and are much used as a packing material. The plant abounds in alkali, which is turned to considerable account in the manufacture of soap and glass. The ashes of the full grown plant are very useful in the wash-house for the purpose of economizing soap; they are mixed with enough water to allow of their being made up into balls, which are dried, and when required for use are put into fire until they acquire a red heat, when they are taken out and thrown into water, which in an hour or so becomes a strong ley. Moreover, the plant is so astringent, that it has been employed for the purpose of tanning kid and chamois leather. Medicinally this plant is said to have had among the ancients a reputation in chronic disorders, especially those arising from obstructions of the viscera and spleen; but it is not now much esteemed, though sometimes used in the form of powder to destroy worms, especially the tape worm; the caudex is the part used, in doses of from one to three drachms, repeated for several mornings, and followed by a brisk purgative.

"No plant can require a less amount of cultivation when it is established, but there is a real or imaginary difficulty about transplanting it. Sir J. E. Smith says, 'the roots [underground stems] are generally killed by transplantation.' Mr. Taylor, a successful

fern cultivator, informs me, however, that he removes it from the waste land both for rockwork and potting, and finds it move well at any season of the year; being moreover a great pest in his cucumber beds, when the underground stems are among the soil used, as it comes up over the bed, grows vigorously, and is with difficulty destroyed. I have potted portions of these stems which have lain exposed for some time, and have found them to grow freely. It will grow freely in any temperature. Though it grows in exposed situations, it is very much finer in damp shady places. To form groups of this plant in parks, the following plan, recommended by Mr. Drewett, should be adopted:—'Make choice of some spots of ground which have a partial shade from large trees in summer, say in half acres, and have them trenched, adding, if the land is strong, a good layer of peat, or bog earth; have the ground in readiness for planting in March or April, take up the dormant stems in large square masses from the spots where they have been observed to grow, and plant them immediately at about a yard apart; enclose the patches with park hurdles to prevent cattle from spoiling them before they get established.' *Polystichum aculeatum*, which is perfectly evergreen, is a very suitable companion."



Adiantum Capillus-veneris.

This *Handbook of British Ferns*, from its convenient size and abundant information, will be a suitable and pleasant companion for the field botanist, as well as the home culturist and the student.

To resume. The species of ferns indigenous to the United Kingdom are distributed throughout the following eighteen genera:—

I.—*Polypodium*: 1. *P. vulgare*, and three varieties; evergreen in sheltered places; suitable for rockwork. 2. *P. Phegopteris*; rockwork. 3. *P. Dryopteris*; rockwork. 4. *P. calcareum*; rockwork.

II.—*Allosorus*: 1. *A. crispus*, and two varieties; ornamental; rockwork.

III.—*Woodsia*: 1. *W. ilvensis*. 2. *W. alpina*. Both rare, curious; suitable for pot culture.

IV.—*Lastrea*: 1. *L. Thelypteris*; damp peaty border. 2. *L. Oreopteris*; shady border. 3. *L. cristata*; damp peaty border. 4. *L. Filix-mas*, and two varieties; shady border. 5. *L. rigida*; shady border. 6. *L. spinulosa*; peaty border. 7. *L. dilatata*; peaty border. 8. *L. Fœnisecii*; peaty border.

V.—*Polystichum*: 1. *P. Lonchitis*; evergreen; pots. 2. *P. aculeatum* and variety; evergreen; shady border. 3. *P. angulare* and two varieties; evergreen; shady border.

VI.—*Cystopteris*: 1. *C. fragilis* and three varieties; rockwork or pots. 2. *C. alpina*; rockwork or pots. 3. *C. montana*; rockwork or pots.

VII.—*Athyrium*: 1. *A. Filix-femina*, and several varieties; damp shady border.

VIII.—*Asplenium*: 1. *A. fontanum*; evergreen; pots or rockwork. 2. *A. lanceolatum*; evergreen; pots or sheltered rockwork. 3. *A. Adiantum-nigrum*; evergreen; rockwork; 4. *A. marinum*; evergreen; pots, in-doors. 5. *A. Trichomanes*; evergreen; rockwork or pots. 6. *A. viride*; evergreen; rockwork or pots. 7. *A. Ruta-muraria*; evergreen; pots or rockwork. 8. *A. germanicum*; evergreen; pots or rockwork. 9. *A. septentrionale*; evergreen; pots or rockwork.

IX.—*Ceterach*: 1. *C. officinarum*; evergreen; pots or rockwork.

X.—*Scolopendrium*: 1. *S. vulgare*; evergreen; shady borders, rockwork, or pots.

XI.—*Adiantum*: 1. *A. Capillus-veneris*; evergreen; pots, in-doors, or under hand-glasses.

XII.—*Blechnum*: 1. *B. Spicant*; rockwork, or damp peat borders.

XIII.—*Pteris*: 1. *P. aquilina*, shady border.

XIV.—*Trichomanes*: 1. *T. radicans*, and one variety; evergreen; pots in a warm close atmosphere.

XV.—*Hymenophyllum*: 1. *H. tunbridgense*; and 2. *H. unilaterale*; fronds persistent; pots, in a close damp sheltered atmosphere.

XVI.—*Osmunda*: 1. *O. regalis*; damp peat border.

XVII.—*Botrychium*: 1. *B. Lunaria*; shady peat border.

XVIII.—*Ophioglossum*: 1. *O. vulgatum*; shady border.



Asplenium Adiantum-nigrum.

The most ornamental species for rockwork are the following :—*Polypodium vulgare* and *Dryopteris* ; *Allosorus crispus* ; *Polystichum Lonchitis*, *aculeatum*, and *angulare* ; *Lastrea rigida* ; *Cystopteris*, all the species ; *Athyrium Filix-femina*, var. *crispum* ; *Asplenium*, all the species ; *Ceterach officinarum* ; *Scolopendrium vulgare* ; *Blechnum Spicant*.

The best species for planting in damp shady situations, such as woods, and dells, and thickets, are the following :—*Lastrea Oreopteris*, *Filix-mas*, and its var. *incisa*, *rigida*, *spinulosa*, *dilatata*, and *Fœnisecii* ; *Polysti-*

chum aculeatum and *angulare* ; *Athyrium Filix-femina* ; *Blechnum Spicant*, and *Osmunda regalis*.

For pot-culture, as objects of ornament, the following are highly suitable :—*Polypodium vulgare*, var. *cambricum*, *Dryopteris*, and *Phegopteris* ; *Allosorus crispus* ; *Athyrium Filix-femina*, vars. *crispum* and *multifidum* ; *Asplenium lanceolatum*, *fontanum*, *Adiantum-nigrum*, *Trichomanes*, and *marinum* ; *Ceterach officinarum* ; *Adiantum Capillus-veneris* ; *Trichomanes radicans* ; *Hymenophyllum tunbridgensse* and *unilaterale*.

All the smaller species of ferns may be grown in a compost of equal parts turfy peat and well decayed leaf-mould, intermixed with pure white sand, and small lumps of charcoal, or broken pots, bricks, or porous stone. Whether in pots, or planted out in any situation, they must (with one or two exceptions,) be well drained ; for they mostly require to be kept very moist, and if the soil is not well drained, it soon becomes soddened, and in that state is injurious to the roots. When they are grown in pots these should be half filled with drainage materials, especially in the case of the more delicate, and the smaller-growing species. The more robust and the freer-growing of the species should have larger pots, less drainage, and a proportion of loamy soil added to their compost. Some few species like the addition of old mortar as an ingredient in the compost in which they are planted ; such are *Polypodium calcareum* ; *Ceterach officinarum* ; and *Asplenium Trichomanes*, and *Ruta-muraria*.

Of all known plants ferns are the most suitable for planting in the pent-up shaded "court-yards," "areas," and "flats," of town residences, the monotonous mural enclosures of which, relieved by tasteful rockwork, and fringed with elegant fern-fronds, may be invested thus with some degree of cheerfulness.

NEW FLOWERS AND PLANTS.

BURTONIA VILLOSA, *Meisner* (villous *Burtonia*).—*Fabacæ* § *Papilionacæ*—*Pultenææ*.—A beautiful hard-wooded shrub, heath-like in general aspect, bearing conspicuous butterfly-shaped flowers. The habit is close and branching ; the branches, as well as the leaves, being clothed, in a more or less degree, with short hairs. The leaves are dense, sessile, and alternate, consisting each of three linear obtuse leaflets, the margins of which are remarkably revolute. The flowers grow towards the extremities of the branches, from the axils of the upper leaves, so as to form an oblong, almost terminal, leafy spike, the

flowers being so numerous as to conceal the leaves among which they are attached ; the colour is a rich palish purple red, the wings being whitish at the base, and the standard having a round primrose-coloured blotch at its base. The heath-like appearance of this shrub is due to the numerous narrow sessile leaflets which invest the stems. Native of New South Wales, in the Swan River colony. Introduced in 1846. Flowers in May. *Culture*.—Requires a greenhouse ; turfy peat, loam, and sand, with plenty of drainage ; propagated by cuttings in sand under bell-glasses.

CHIRITA MOONII, *Gardner* (Mr. Moon's

Chirita).—*Gesneraceæ* § *Cyrtandraceæ*-*Didymocarpidæ*.—A very beautiful sub-shrubby plant, growing from two to three feet in height; with obscurely tetragonal stems, opposite or whorled pale-green leaves, of a rather acute ovate-lanceolate figure, and axillary blossoms, of large size, usually produced singly from the axils, but sometimes two together. The leaves are clothed with compact silky down, which is most conspicuous beneath. The corolla is large and conspicuous, from the base to the extremity of the lower lip being nearly four inches in length; the tube is ventricose and sub-campanulate, curving a little upwards, pale purple and silky, with an expanded mouth, and broad yellow dash down the centre of the throat; the limb is spreading, two-lipped, of five roundish lobes, and of a deep purple colour, well contrasted with the paler tint and yellow bar of the throat. Native of Ceylon, at "Four Korles," and on "rocks near the summit of the Hantani range." Introduced in 1847. Flowers throughout the summer months. Mr. Moon, the original discoverer, in a "Catalogue of Ceylon plants," calls it *Martynia lanceolata*. *Culture*.—Requires a stove; light rich soil of turfy texture; propagated by cuttings of the young shoots, planted in sandy soil, and placed in heat.

ARNEBIA ECHIOIDES, *Alph. De Candolle* (echium-like *Arnebia*).—*Boraginaceæ* § *Anchusidæ*.—A very pretty herbaceous perennial furnishing yellow blossoms in a natural order in which they are by no means common. It has a fusiform woody root, from which spring up the leafy stems, attaining about six inches in height, and clothed with short hair. The leaves are spreading, pubescent, sessile; the lower ones largest, obovate-oblong, those of the stem smaller, obovate-lanceolate. The flowers grow at the top of the stems in a branched scorpioid leafy raceme; they are between funnel-shaped and salver-shaped, with a slender tube, yellow, with five roundish purple spots, one being situated at the juncture between each pair of the lobes into which the limb is divided. Sometimes the spots are obsolete in the cultivated plant, as we learn from Sir W. Hooker's account of the plant. Native of the Caucasian alps, and of Armenia. Introduced in 1847. Flowers in June and July. It is the *Anchusa echioides* (Bicherstein); *Lycopsis echioides* (Linnaeus); and *Lithospermum erectum* (Fischer and Meyer.) *Culture*.—Hardy; common loamy soil; propagated by division of the plant. Suitable for pot-culture among Alpine plants.

PASSIFLORA AMABILIS, *Hooker* (white-crowned Passion-flower).—*Passifloraceæ*.—A most lovely passion-flower, the history of which is, however, obscure. It is a climb-

ing plant of moderate growth, with slender rounded stems, bearing alternate entire leaves, which are ovate and very acute in figure, and have glandular petioles; the stipules are short, entire, ovate-acuminate. The flowers spring from the axils of the leaves along with the tendrils, and are supported by an involucre of three roundish-ovate reticulated leaves. The sepals and petals, forming a ray of ten oblong obtuse divisions, are alike in form and colour, the latter being a bright red on the inner side; the filamentous crown, often in passion-flowers variegated in colours, is in this kind almost entirely white, and is disposed in four series; the contrast between the white of this part and the bright red of the sepals and petals produces a very charming effect, which must render this plant a favourite with all who have convenience to cultivate it. It is thought to be possibly a hybrid, and is known in gardens under the name above quoted, which Sir W. Hooker has adopted. Native country unknown. Introduced in 1847, to the Royal Garden, Kew, by Mr. Mackay, of Liege. Flowers in May. *Culture*.—Requires a stove; turfy-peat and loam intermixed with sand; propagated by cuttings from any part of the stems, planted in very sandy soil, and set where they are supplied with a moderate degree of bottom heat.

THUNBERGIA ALATA, *var. aurantiaca*, *subvar. Doddii* (Dodd's *Thunbergia*).—*Acanthaceæ* § *Thunbergiæ*.—This garden variety of the well-known and very beautiful orange-flowered *Thunbergia* differs from its parent only in having the leaves irregularly margined with white, so that the foliage is variegated. Our own opinion of it is, that it is less handsome than *T. aurantiaca*, wanting altogether the rich green of a well grown example of that plant, as a background for displaying its fine orange-and-black blossoms; others, however, admire its variegation. It is a slender free growing climber, with somewhat hastate leaves, white at the edge, and large rich orange coloured blossoms, borne singly in the axils of the leaves. A garden variety obtained by Mr. Dodds, gardener to Colonel Baker of Salisbury. Raised in 1847. Flowers through the summer and autumn. *Culture*.—Requires a warm greenhouse or a cool part of a stove; strong turfy peat with a small portion of loam; propagated by cuttings planted under glasses in sand.

ACHIMENES LONGIFLORA, *var. macrantha* (large-flowered blue *Achimenes*).—*Gesneraceæ* § *Gesneriæ*.—A very showy plant, differing from the ordinary state of *Achimenes longiflora* chiefly in the size of the blossoms, which are very large, constituting a decided improvement on the original kind. In other

respects, the variety pretty closely agrees with its parent, and like it, is deserving of cultivation. A garden variety. Raised in 1847. Flowers in the summer months. *Culture*.—Requires a stove, or to be raised in heat in spring, and flowered in a warm greenhouse; light vegetable soil; propagated by means of the scaly tubers.

PHALÆNOPSIS ROSEA, *Lindley* (pink Butterfly-plant).—Orchidaceæ § Vandææ-Sarcanthidææ.—A very pretty epiphytal species, and a most interesting addition both to our gardens, and, botanically speaking, to the genus of which it forms a part. The plant is stemless, with exactly the habit of the *Ph. amabilis*. It is furnished with narrow-oblong leathery leaves, eight to twelve inches long, and sharp and recurved at the point. The flowers grow in a loose spike at the end of a stiff ascending lateral stalk; this spike is sometimes said to be as much as from twelve to eighteen inches long. The flowers are individually small, but numerous, about an inch in diameter; the sepals are spreading, oblong-lanceolate, and somewhat acute, the colour being white, slightly tinged with pink; the lip is deep violet or rose-colour red, ascending, the central division ovate-acuminate, slightly lozenge-shaped, the lateral linear-spathulate, oblique and incurved. Native of Manilla. Introduced in 1848, by Messrs Veitch of Exeter. Flowers in September. *Culture*.—Requires a hot moist stove; to be fastened on a block of wood and suspended; propagated by dividing the plant.

NEPENTHES LÆVIS, *Lindley* (smooth Pitcher-plant).—Nepenthaceæ.—An interesting addition to the family of pitcher-plants. It seems to be allied to the *N. phyllamphora*, but is perfectly distinct. The leaves are narrow, leathery, and shining, wholly destitute of fringed teeth, or pubescence. The pitchers are from two to four inches long, inflated towards the base, and contracted about the mouth, and having a pair of narrow elevated crests, which are either fringed or naked; the brim of the pitcher is very narrow and without ribs, the lid nearly circular, except at the base, which is cordate and spurred. Native of Java and Singapore. Introduced in 1848, by Messrs. Veitch of Exeter. Flowers —? *Culture*.—Requires a hot moist stove; very light turfy peat soil, almost entirely fibrous, intermixed with broken charcoal or potsherd; propagated by cuttings.

ACROPERA BATEMANI, *Lindley* (Mr. Bateman's Acropera).—Orchidaceæ § Vandææ-Maxillariidææ.—A distinct, but not very handsome, epiphytal species, with much the appearance of *Acropera Loddigesii*, but more robust. The flowers are pale yellow and spotted as in that species; the lateral

sepals are doubled backwards, so that the opposite sides of each nearly touch; the petals are oblong with an awl-shaped point, and the apex of the lip is two-lobed, the divisions linear-obtuse, that is, the lip is "extended at the end into a double tongue." Native of Nicaragua. Introduced in 1847. Flowers about August. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the plant.

MILTONIA FLAVA, *Lindley* (yellow-flowered Miltonia).—Orchidaceæ § Vandææ-Brassidææ. A pretty epiphytal species. The leaves are not described. The flowers grow solitary on the stalks, which have two ranked boat-shaped sheaths; they are yellow, and not unlike those of *M. stellata*, differing in some technical matters. The sepals are linear-lanceolate, and acuminate; the petals of the same form, but twice as broad; the lip panduriform or fiddle-shaped, slightly hairy, with a cordate-ovate end, and near the base an elevated ridge, which reaches half-way down the lip, and divides at the point into two short plates. Native of Brazil. Introduced probably about 1843. Flowers in July. *Culture*.—Requires a stove; turfy peat soil; propagated by division of the plant.

CLIMATE OF NEW HOLLAND.

In the recently published number of the Horticultural Society's Journal,* Dr. Lindley has given some memoranda concerning the climate of New Holland, which it is probable will be found highly useful to cultivators. These memoranda are gleaned from the journal of Sir T. L. Mitchell, aided by an examination of that naturalist's collections and private notes. The general results are stated in a passage which we cannot refrain from quoting:—

"The reader will doubtless be surprised to find how low a temperature was occasionally observed on this journey. In the end of April (our October) in latitude 28° S., within 4½° of the Tropic, at an insignificant elevation, the thermometer stood at 26° at sun-rise, and was as low as 43° at nine P. M.; nevertheless, the country produced wild Indigo, Mimosas, Casuarinas, arborecent Myrtleblooms, and Loranths. A degree nearer the Tropic in May (our November) the thermometer at sun-rise marked 20°, 19°, 18°, 17°, 16°, 12°, and on two separate days even 11°! On the 22d of May the river was frozen, and yet herbage was luxuriant, and the country produced Mimosas, Eucalypti, Acacias, the tropical Bottle-tree (*Delabechea*), a *Calandrinia*, and even a Loranth. On the 23d of May, the thermometer at sun-rise marking 12°, Acacia

* Journal of the Horticultural Society, vol. iii. p. 282.

conferta was coming into flower, and Euca-lypti, with the usual Australian vegetation, were abundant. On the 30th of May, at the elevation of 1,118 feet, the almost tropical Delabechea was found growing, with the temperature at sun-rise 22° and at nine P.M. 31°, so that it must have been exposed to a night's frost gradually increasing through 12°. And this was evidently the rule during the months of May, June, and July (our November, December, and January); in latitude 26° S. among Tristanias, Phebaliums, Zamias, Hoveas, Myoporums, and Acacias, the evening temperature was observed to be 29°, 22°, 37°, 29°, 25°, falling during the night to 26°, 21°, 12°, 14°, 20°; in latitude 25° S. the tents were frozen into boards at the elevation of 1,421 feet, the thermometer, July 5, sunk during the night from 38° to 16°, and there grew Cryptandras, Acacias, Bursarias, Boronias, Stenochiles, and the like. Cymbidium canaliculatum, the only orchidaceous epiphyte observed, was in flower under a night temperature of 33° and 34°; that by day not exceeding 86°. These facts throw quite a new light upon the nature of Australian vegetation. It may be supposed that so low a temperature must have been accompanied by extreme dryness, and such appears to have been usually the case. Nevertheless, it cannot have been always so, for although we have no hygrometrical observations for June and July, and only four for May, yet there is other evidence to show that the dryness cannot always have been remarkable. In May the hygrometer indicated .764, .703, .934, or nearly saturation, and .596; yet the sun-rise temperature was on those occasions 25°, 28°, 30°, and 34°. On the 22d of May, the grass was white with hoar frost, and then the thermometer was at sun-rise 20° under canvass and 12° in the open air; and on the 5th of July, when it rained all day and the tents were 'frozen into boards,' the thermometer sank during the night from 38° to 16°.

"It is probable that this power of resisting cold is connected with the very high temperature to which Australian vegetation is exposed at certain seasons, and this is horticulturally a most important consideration. We find that in latitude 32° S. in January (our July) the thermometer stood eight days successively above 100°, and even reached 115° at noon; that it was even as high as 112° at four P.M.; that in the latter part of February one degree nearer the line it was twice 105° and once 110°; that in March one degree further northward it frequently exceeded 100°, and there was not much fall in this excessive temperature up to the end of April. This will be more evident from the following—

Table of Noon-day Temperatures.

Lat.	Month.	Average.	Max.	Min.
29° S.	Nov., Dec.	3 Observ. . 102°	103°	62°
32 S.	Jan., Feb.	18 " . 97½	115	73
31 S.	Feb., March	17 " . 90	110	80
30 S.	March	20 " . 95	105	84

"At this time the dryness must also be excessive, as will have been seen by Sir Thomas Mitchell's observations. Even such heats as these do not, however, destroy the power of vegetation, for we find in the midst of them all sorts of trees in blossom, a few bulbs, and even here and there (in damp places, no doubt) such soft herbs as Goodenias, Trichiniums, Helichrysum, Didiscus, Teucrium, Justicia, herbaceous Jasmines, Tobacco, and Amarynthas. During these heats the night-temperature seldom remains high. Sometimes, indeed, the thermometer was observed as much as 88° and once even 97° at sun-rise, the average noon heat of the month being 97½°, but generally the temperature is lower. Thus:—

	Average at Noon.	Temperature Occasionally at Sun-rise.				
Nov. and Dec.	102°	62°	58°	61°		
Jan. and Feb.	97½	61	60	59	47°	&c.
Feb. and March	90	61	59	54	48	&c.
March	95	68	55	51	47	&c.

"To this point the attention of cultivators must be carefully directed. I think it is impossible to doubt, from the observations thus referred to, that high winter temperature in hot-houses is a great mistake, and that the practice of gardeners requires, in this respect, to be very carefully reconsidered."

THE FLOWER GARDEN OF THE POETS.

WE have introduced our readers to a number of the minor poets as they appear contemplating those bright pages in the *Book of Nature* which display the various and brilliant beauties of the Flower Garden. They all loved to linger among the rich gifts of Flora, and their language often acquires a double sweetness from the associations which it raises. Turning from them to those lofty and gigantic minds whose dimensions were equal to the grasp of the mightiest subjects,—the pinnacles, as we may call them, of the great city of poetry,—we find them directing their gaze towards the humblest and lowliest of those numerous ornaments which spangle the surface of the earth, which bloom

on the slope of the mountain, in the hollow of the valley, in the rays of the sun, and in the secluded shade of the forest. The men whose imaginations were so vast that no subject, however insignificant or majestic, was beyond the circle of their capacity, whose thoughts could range over the whole face of creation, and settle upon the highest pinnacles of wisdom, as well as upon the lowliest flower of the valley; these men loved to sit amid the sweetness of a garden, and to weave from the glittering beauties there displayed, an endless succession of the choicest garlands of thought. Milton was an eminent example. He loved to picture the convulsions of the universe, the wars of heaven, and the most terrible aspects of hell; but he also delighted in the description of flowers, and places made sweet by their presence. From them Paradise derived one of its chief attractions. Whether he would create the idea of happiness, innocence, love, pleasure, or beauty, some simple flower is ready to be invested with the thought, and in the thornless rose of Eden we discover the emblem of that peace and harmony which has, in the mind of the poet, constituted the most perfect bliss.

We will suppose Milton sitting in that magnificent garden, where the first parents of the human race enjoyed their short-lived happiness, where "flowers worthy of Paradise" were sprinkled over the ground, not in artistic order, but scattered in rich plenty over hill and dale, and plain, presenting to the eye the variously-coloured expanse, where

"The flowery lap
Of some irriguous valley spread her store;
Flowers of all hue, and without thorn the rose."

In one direction, as we learn from Eve, when she urges her husband to divide the pleasant labours of Paradise, the poet beheld

"A spring of roses intermixed with myrtle."

And again, in another spot, the roses budded so thick about, that Adam could scarcely discern the outline of the woman's form as she stood tending the flowers that bloomed so luxuriantly around the palmy hillocks—

"Oft stooping to support
Each flowery tender stalk, whose head though gay
Carnation, purple, azure, or specked with gold,
Hung drooping unsustained; them she upstays
Gently with myrtle-band."

There never was, we believe, a poem of any length in which the rose did not supply a simile on the subject of a glowing and enthusiastic description. From Homer's time to the present this has been the case.

"The blind old man of Chio's rocky isle"
describes

"The rosy finger'd morn"

as parting the roseate curtains of the day.

"The rosy bosomed hours,"

described in *Comus*, forms a favourite quotation. Milton places it almost first among flowers, and in his song commencing

"Sabrina fair,
Listen where thou art sitting
Under the glassy, cool translucent wave,
In twisting braids of lilies, knitting
The loose train of thy amber-dropping hair,"

he entreats the goddess of the silver lake to rise and

"Heave her rosy head"

from out the depths of the stream. The sleeping-couch of young Adonis is formed of hyacinths and roses, and to the silver-buskined nymphs, whose presence haunts the forests of Arcady, he addresses the line,

"And ye, the breathing roses of the wood."

So that in the rose Milton saw the highest perfection of loveliness. From it he created the most delicate ideas, and where nature spread it profusely over the landscape, there he imagined the very spirit of beauty to linger. But his fondness for this flower did not prevent him from indulging in the most luxurious thoughts, where other of those sweet ornaments displayed themselves before his mind's eye. The repose of Adam and Eve is rendered more delicious by the fact that

"Flowers were the couch,
Pansies and violets, and asphodel,
And hyacinth, earth's freshest, softest lap."

It is not only in his longer poems that Milton pays tribute to the beauty of the flower-garden. Scattered throughout all his other works we find the evidence of that taste which was in him almost a passion, if dilating on the richness of those treasures to be found in the stores of nature. We find him, as it were, sitting

"By slow Meander's margent stream,
And in the violet-embroidered dale,"

listening to the voice of Echo, "the queen of parley."

Again, we encounter him

"Upon a bank
With ivy canopied, and interwove
With flaunting honeysuckle."

Milton must have studied with much attention the science of flowers, for he speaks of them not only with the enthusiastic raptures of the admiring poet, but also with the ease and knowledge of the amateur. He knew their seasons, and could tell the time of their

coming. He was well aware of their several natures and virtues, and was not ignorant of the order in which they appear through the several months. We could mention those poets who, carried away by enthusiasm, or lost in ignorance, fling together a profusion of figures and thoughts, heaping up strange flowers in company, and creating impossible combinations in order to produce a glittering picture. But Milton does not thus err. He places each flower in its proper season and situation. From

"The cowslip's velvet head,
That bends not as I tread,"

to where, in the regions of eternal summer,

"The west winds with musky wing
About the cedarn alleys fling
Nard and Cassia's balmy smells;
Iris there, with humid bow,
Waters the odorous banks that blow;
Flowers of more mingled hue
Than her purpled scarf can show;"

all are correctly spoken of, and distinguished by appropriate epithets. On the river bank, in the wood, on the turfy lawn, in the open mead, and in the

"Hazel copses green,"

we find flowers flourishing in all their various beauty. Of whatever he may be speaking, from that

"When first the white-thorn blows,"

to the month when all the fields and gardens are gay with blossoms, he continually revels in those glowing descriptions which constitute so great a part of the beauty of his poems. But perhaps the passage in which Milton's love of the flower garden appears to the greatest advantage, is that which occurs in *Lycidas*. We here perceive his great acquaintance with the volume of nature, his minute observance of trifles, with which he forms a succession of the richest ideas.

"Return, Sicilian muse,
And call the vales, and bid them hither cast
Their bells and flow'rets of a thousand hues;
Ye valleys low, where the mild whispers rise
Of shades and wanton winds, and gushing brooks,
On whose fresh laps the swart star sparsely looks,
Throw hither all your quaint enamell'd eyes,
That on the green turf suck the honey'd showers,
And purple all the ground with vernal flowers;
Bring the rash primrose that forsaken dies,
The tufted crow too, and pale jessamine,
The white pink and the pansy peaked with jet,
The glowing violet,
The musk rose and the well attired woodbine,
With cowslips wan that hang the pensive head,
And every flower that good embroidery wears;
Bid Amaranthus all his beauty shed,
And daffodills fill their cup with tears,
To strow the laureate verse where Lycid lies."

Nothing can be more exquisite than this fragment. As we read, we call up the flowers

before us, and by the time we arrive at the close, there lies stretched out before our mind's eye a scene so lively, so brilliant, that the imagination fails to receive all the bright impressions created. From these verses, hundreds of others have been coined by writers whose thoughts were so imbued with the rich magnificence of Milton's poetry, that they have often, perhaps unconsciously, fancied they were forming ideas of their own, while they in reality wrote nothing but a mass of verse, whose brilliancy was borrowed, and almost lost in the cloud of weak and dull imagery.

We shall not pause to wander with Milton over the

"Meadows trim with daisies pied;"

nor shall we stay to hear the story of Hyacinth transformed by Apollo into a purple flower. One more extract we must, however, make. It is of unequalled beauty, and forms the first of four lines of a sonnet on May morning:—

"Now the bright morning star, day's harbinger,
Comes dancing from the east, and leads with her
The flowery May, who from her green lap throws
The yellow cowslip and the pale primrose."

Shakespeare next claims our attention. Our choice has been accidental; we draw no comparison between the two poets, for there is no analogy between them. We immediately perceive the different cast of thought which pervades their poetry:—

"And I serve the Fairy Queen,
To dew her orb upon the green.
The cowslips tall her pensioners be,
In their gold-coats spots you see;
These be rubies, fairy favours,
In those freckles live their savours;
I must go seek some dew-drops here and there,
And hang a pearl in every cowslip's ear."

Whether the savours of the cowslip proceed from the spots in their gold coats, we do not think has been determined by botanists. The mention of the fact, however, by Shakespeare, proves his minute observation, and we conjecture that he must have been told, or have read of the fact, somewhere. This, however, though curious, is perhaps not important, and we leave the discussion of it to others, and hurry on to the delicious description of Titania's forest couch:—

"I know a bank whereon the wild thyme blows,
Where ox-lip and the nodding violet grows,
Quite over-canopied with luscious woodbine,
With sweet musk-roses and with eglantine."

The Queen of Fairies retiring to rest, gives her orders to the attendant train before lying down to sleep:—

"Hence!
Some to kill cankers in the musk-rose buds."

For she wished to preserve the beauty of those

sweet graces from being injured by those mischievous agencies very often touched on by the poet,

"As killing as the canker to the rose."—MILTON.

The canker in the rose is a favourite simile. Shakspeare has it more than once :—

"As in the bud bit with an envious worm,
Ere he can spread his sweet leaves to the air,
And dedicate his beauty to the sun."

And again, in his fifty-fourth sonnet, he gives expression to an idea of the same kind :

"The rose looks fair, but fairer we it deem
For that sweet odour which doth in it live;
The canker'd blooms have full as deep a dye
As the perfum'd tincture of the roses
Hang on such thorns, and play as wantonly,
When summer's breath their masked bud discloses."

The property which renders the rose so much admired, that of retaining its scent when the beauty of its appearance has gone, when its leaves are withered, when it has shrunk into nothing, gives occasion for a fine figure. Shakspeare expresses this well. He has been speaking of the things which are valuable only so long as their beauty lasts,—whose virtue dies with their show.

"Sweet roses do not so;
Of their sweet deaths are sweeter odours made."

Spenser, the quaint poet of Fairyland, does not appear to have been possessed by the love of flowers in a degree half so extreme as that by which the other poets have been influenced. He seldom makes allusion to them except generally. This we cannot fail to regret, evident as it is that, had he chosen them for his theme in any portion of his poem, his easy and rapid pen could have delineated a picture than which nothing could be more pleasing. In the march of the months, however, occasional references occur to the flowery gifts of nature. April is described as riding upon a bull, whose horns are

"Gilden all with golden studs,
And garnished with garlands goodly bright,
Of all the fairest flowers and freshest buds."

And May comes leaping forward—

"Deckt with all the dainties of her season's pride,
And throwing flowers out of her lap around."

The altar prepared for the sacrifice of Serena is decked "with ariest flowers," and for the victim a garland is prepared. The lovely Medora is represented with "a chaplet of sundry flowers" on her head, and her hair "with flowers bescattered." The "dædale earth" is spoken of as throwing forth—

"Out of her fruitful lap abundant flowers."

On several other occasions Spenser brings in an allusion to flowers; but, on the whole, he seems not to have taken much delight in them, preferring rather to dilate,

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either on grim spectacles, or on the more gorgeous and brilliant magnificence of palaces and castles. From him let us turn to Byron, the poet of gloom. He, too, shows little liking for flowers. He takes but little pleasure in the soft and gentle beauties of the garden, but rather loves to turn his ambitious thought towards the passions, and to that grandeur and magnificence of description in which these humble ornaments would be lost. He is almost the only poet who associates with them any idea contrary to that of happiness or innocence :—

"Flowers whose wild odours breathe but agonies."

However, there is rich beauty in the lines :—

"Gently flows
The deep-dyed Brenta, where their hues instill
The odorous purple of a new-born rose
Which streams upon her stream, and glass'd within it
glows."

But Byron, as we have said, was no lover of flowers, and we must leave him. His poems contain occasional allusions to them, among which perhaps one of the most delicate is the following :—

"I saw her weep; the big round tears
Fell from that eye of blue,
And to my eye it did appear
A violet dropping dew."

Such allusions, however, are, in his poems, few and far between. Far otherwise was it with numerous other poets, whose ideas constantly fall into the strain, and borrow beauty and imagery from the flower garden. In the "flowery fields of joy" of Joseph Warton we find Youth and Mirth

"Nodding their lily-crowned heads
Where Laughter rose-lipp'd Hebe leads."

And, further on, what can be more beautiful than the couplet ?—

"When young-eyed Spring profusely throws
From her green lap the pink and rose."

There is less, however, in this poem which refers to flowers than might have been expected. Flowers form the very crown of Fancy; and, in an ode to the nymph, we look for more allusion to them. Dryden very often touched on flowers. His versification, though wanting in the grandeur which renders the poetry of Milton, Shakspeare, and Byron so pleasant to the ear, yet flows smoothly, and, as it were, glides along without effort.

"The sycamores with eglantine were spread,
A hedge about the sides, a covering overhead,
And so the fragrant briar wove between
The sycamores, and flowers were mixed with green
And the fresh eglantine exhaled a breath
Whose odours were of power to raise from death."

We shall now introduce our readers to the quaint but yet graceful poetry of Andrew

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Marvel, whose imagination often delights itself with the luxuries of the flower garden. His idea of it is, however, not of the usual kind; he does not delight in well ordered parterres, in straightly laid walks, and artistically-planned arrangements; he would rather revel in a wild profusion of flowers, and see beauty in disorder. The verses are supposed to be sung by the nymph complaining of the death of her fawn :—

"I have a garden of my own,
But so with roses overgrown,
And lilies, that you would it guess
To be a little wilderness;
And all the spring-time of the year
It only loved to be there.
Among the beds of lilies I
Have sought it oft where it should lie;
For in the flaxen lilies' shade
It like a bank of lilies laid.
Upon the roses it would feed
Until its lips e'en seemed to bleed;
And then to me 'twould boldly trip,
And print these roses on my lip;
But all its chief delight was still
On roses thus itself to fill."

Michael Drayton, a poet of the same class, though not perhaps possessed of so much power, will not miss the opportunity to glance at the gifts of Flora.

"A maiden, on a morn betime,
Went forth, when May was in the prime,
To get sweet seth-gall,
The honeysuckle, the harlock,
The lily and the lady-smock;
Thus she wander'd here and there,
And pick'd off the bloomy brier."

Perhaps, as we started with saying that we should confine ourselves in the present article to the loftier pinnacles of poetry, it may appear somewhat strange that, stooping from the level on which we have hitherto ranged, we pick up Elijah Fenton and cull a flower from his modest garden plot. He pretends to little, and does not accomplish very much; but his poetry, though neither grand nor brilliant, is not without its sweetness; and we may be pardoned for bringing him into company with the brighter luminaries which, in the poetical firmament, revolve around Shakespeare and Milton; but these luminaries have their satellites, and we select a verse from one of them :—

"At length the lusty spring prevails,
And swift, to meet the smiling May,
Is wafted by the western gales.
Around him dance the rosy hours,
And damasking the ground with flowers,
With ambient sweets perfume the morn."

The lines are sprightly, and not without merit. Of a different class, but yet quite as happy in expression, is the following passage in Lobbin Clart's panegyric on Blowzelinda. Every one will recognise John Gay in these verses :—

"My Blowzelinda is the blithest lass;
Than primrose sweeter, or the clover-grass.
Fair is the king-cup that in meadow blows,
Fair is the daisy that beside he grows
Fair is the gilliflow' of gardens sweet;
Fair is the marigold of pottage meet:
But Blowzelind than gilliflow'ers more fair,
Than daisy, marigold, or king-cup rare."

The poet is here humble, and his ideas are humble. He confines himself to lowly flowers, for he is treating of a lowly subject; and the gastronomic allusion contained in the lines does not take away from their sweetness.

Our readers will, we are sure, thank us for introducing to them William Hamilton, the Ayrshire poet, whose productions are marked by much genius and originality. There is genuine beauty in the lines we extract :—

"Mark how Nature's hand bestows
Abundant grace on all that grows;
Tinges with pencil hue, unseen,
The grass that clothes the valley green;
Or spreads the tulip's parted streaks,
Or sanguine dyes the rose's cheeks."

This is the only specimen we shall give from William Hamilton; but it is a gem of thought. Were our inclination to tend that way, we could multiply, to an indefinite extent, instances of the delight which the poet has almost always felt in dwelling on the beauty and luxury of a flower-garden. The "perfume-breathing rose," the "innocent lily," the "sweet flower of the valley," the "various tulip," the "golden cowslip,"—all share in the poet's praise, some for the brilliancy of their colours, others for the sweetness of their perfume :—

"Full many a flower of sweetness grows;
The lily and the damask rose,
The jasmine and the eglantine,
The pendants of the sweet woodbine,
The snowdrop and the pimpernel,
The pansy and the bright blue-bell :—
All these are sweet—I love them well—
All these are sweet and fair, but yet,
Most I love the violet."

And the poet is not alone in his admiration of the "glowing violet." It is, indeed, a magnificent flower! Who can look upon the rich purple-blue, soft as velvet, which forms its chief beauty, without being struck with admiration!

"The violet blue
Sweeter than the lids of Juno's eyes,
Or Cytherea's breath."

So that, for beauty and fragrance, this flower has received the highest praise. It has yet another quality—modesty—for which it has frequently been extolled :—

"Look, where the violet lifts its lowly head—
That rich, sweet flower, whose deep imperial hue
Surpasses all the gorgeous flowers that grow,
And yet it is not proud. It loves to bloom
Far in the valley's depth, or 'neath the shade

Of some steep mossy bank, while other flowers
Delight to flaunt before the admiring eye,
Out in the sunny fields. And yet of them,
Sweet as they are, and beautiful to see,
Not one can claim to rear its fragrant head
Above the modest purple violet."

The old and unknown poet from whose quaint and crabbed language these lines have been extracted and smoothed, was, in our opinion, almost if not quite right. There is scarcely any flower to which we would accord a preference before the violet. But,

"All that's bright must fade,
The brightest still the fleetest;"

and the violet, accordingly, flourishes for but a brief period, and withers.

Perhaps our readers may not have been uninterested in the perusal of the expression of the poet's sympathy with the beauties of the flower-garden. We have sauntered

through the "flowery paths of poesy," and marked a few of the most glittering specimens. But it must not be imagined we have culled all the rich blossoms there to be gathered. An infinite number remain. From Shakspeare we have selected but one or two choice gems; Milton we have not exhausted; and Byron has only afforded us one or two lines. We have not taxed the pages of Chaucer at all, and have left the Hellenic poets and the poets of ancient Italy for another occasion. Meanwhile, we trust our readers may not have felt uninterested in the selections which we have extracted. It is always pleasant to know what influence is exerted on lofty minds by the varied beauties of nature—and the poet's imagination has seldom failed to be such,—and kindled into enthusiasm by the glowing beauties of the Flower Garden.



GARDENING FOR CHILDREN.*

A PRETTY title for a pretty book, written down to the understanding of a child, but divested of that frivolity which distinguishes

this branch of literature; for certain it is, that the authors of works for the younger branches seem to fancy it necessary to adapt their little books to very childish notions, as if it were desirable to perpetuate them, instead of leading them to better things. This work, built

* Gardening for Children. Edited by the Rev. C. A. Johns, B.A. F.L.S., Author of "Botanical Rambles," &c. London: Charles Cox.

upon the affection which all children have for flowers, even from the cradle—for the youngest infant will stretch forth its little hand for a daisy—teaches the facts connected with gardening in language quite as simple, but by no means so silly, as older volumes teach the little reader that “old Mother Hubbard went to the cupboard,” and forms a contrast worthy of the advanced age. Those children who have been accustomed to the St. Paul’s Churchyard books of instruction, which taught them that “a cow jumped over the moon,” and “a dish ran after a spoon,” will find a great change, and, in all probability, much more delight, in the gardening propensities of “little Willy,” the leading character in “Gardening for Children;” and the idea of his awakening his tutor to the necessity of teaching him gardening, by sowing the caraway seeds out of a cake, is a good one. A child’s notions are formed from objects around him in the same way that a man’s are formed. They are always in advance, because they see certain results arise from certain causes, though they may be often wrong, from the very reason that they are not taught to draw right conclusions; and it is here that we are all wrong. We ought never to allow a child to remain in ignorance for want of satisfying his inquiring mind on all subjects that it is safe to teach: and we should watch the eye as well as listen to the tongue; for nobody can avoid noticing the eagerness with which a child gazes upon anything he does not quite understand; yet, for the most part, children’s books teem with all the absurdities of the worst nursery rhymes, many of which are as questionable, and some of which as unquestionable, as to their propriety or impropriety, as they well can be. We have now before us an illustrated book detailing the adventures of “a little old woman,” whom, to quote the author’s words,

“I have heard tell,
And she went to market her eggs *for* to sell.”

And in doggerel rhyme we are given the particulars of her journey and adventures.

Now, setting aside the vulgarity, and making every allowance for the fun, will anybody defend the getting-up of a shilling book, with bedaubed wood-cuts to illustrate such a subject, for a child’s book? We think not. But let it not be supposed that this is an isolated case; hundreds equally silly, and many quite as vulgar, have been sent forth among the children of this country for the last half century. But, we may be told, we are writing of other books instead of the one we are properly noticing; we admit this, but we do not know how to do justice to a new style of literature for children without exhibiting the faults of the old; and we doubt much if our readers

can so well appreciate the one if they are not reminded of the other.

The little volume before us is edited by the Rev. C. A. Johns, author of “Botanical Rambles,” “Forest Trees of Britain,” and other popular works, who, as Little Willy’s tutor, leads him from time to time through the garden, shows him all the operations, gives him a piece of ground, describes flowers, teaches him how to dig, hoe, rake, weed, and do everything necessary to produce his favourite flowers in perfection, and reads a great moral lesson to “children of a larger growth.” It is not only a little manual of gardening, written with great care, in language that a child can understand, but it shows how much can be done towards rendering a child useful at an early period. Her Majesty has long since provided the young Royal family with plots of garden, and garden implements; and no higher authority is needed for the propriety of making the tillage of the ground part of the education of a child. It is as necessary as any other branch of learning, and to the million it is of more importance than any; for it is a species of information which enables any one in an unknown region to make the earth find him in food. We cannot be supposed to underrate the reading, because that must be acquired before even this valuable little book can be made useful. Upon the whole, we hail the work as the precursor of a new style of literature for children. It is embellished with nearly sixty very superior wood engravings, representing implements used in gardening, and favourite flowers; and it forms one of the best presents that can be made as a Christmas-box or a new-year’s gift. The Rev. Mr. Johns has not forgotten first directions. It is a well-meant and well-done lesson of usefulness, which we should like to see in the hands of every child as soon as he could read; and we are quite sure it is calculated for a school-book, inasmuch as the instructions are fit for all ages. To give an idea of the easy style in which the work is written, we make a few extracts, and at a future time we may return to it; for Mr. Johns has closed the volume with a series of maxims, every one of which is a practical lesson in gardening. We will commence with a few lines from the preface:—

“As the title, ‘Gardening for Children,’ might create an impression that this little book was written to amuse, rather than to instruct, the Editor feels himself called upon to state that all the directions contained in it were furnished by an eminent practical gardener, and are the result of many years’ experience. They are, therefore, not merely adapted for the use of children, but will be

found equally suited for cottagers and amateur gardeners, who have at their command only a small plot of ground."

The correctness of these observations is most fully borne out by the following, or indeed by any extracts we could make from the book :—

"*Nemophila insignis*.—This is a showy annual of a dwarf growth, which soon displays abundance of small blue flowers a little cupped, having a pure white eye, and deeply cut leaves. Its seeds may be sown at different seasons, a few in April, and a few at the end of September ; for if the winter be not very sharp, they will bloom very early in spring, and those sown in spring will come into flower by the time the autumn-sown ones decline. The young plants will bear removal, but I prefer sowing them where they are to bloom ; there is, however, no harm in planting out the few that you take up from a patch when they have been sown too thickly ; and some gardeners make them regularly potted plants, and therefore sow all



in one place, and pot off or plant out at pleasure. They are very beautiful till they begin to straggle along the ground, when, although they still keep flowering a little, I should advise you to pull them up to make room for something better.—P. 10.

"*Sweet Peas*.—These are grown for their scent and abundance of variegated flowers. There are several varieties of colour, and each of the varieties has two or three colours in

itself : they are flowers which require to be supported by sticks or something of the kind ; leafless branches of trees are perhaps the best



support, because the peas will grow over them, and quite hide their unsightly appearance with their mass of flowers. These may be sown ten or twelve in a patch, and they will grow three feet high, so that neat branches of the same height should be placed for the peas to climb over. Some gardeners, however, use only a single stake, and tie up the peas as they grow, till they are two feet six inches high, when they allow them to fall over and form a head of bloom ; but nothing is so good as two or three branched sticks, which support the peas well, and give much less trouble than single stakes. The Sweet Pea is also an old established favourite as a nosegay flower, and may be cut with long stems."—P. 14.

"*The Columbine* you should sow in May, and it will bloom the next year. The plant is as elegant as the lupine [just mentioned] ; the bloom of the very double ones is as rich as it is beautiful, consisting of many horn-shaped florets, which have so quaint an appearance, that they almost remind us of an old-fashioned quilled bonnet. If I knew where to obtain half-a-dozen healthy plants from a good collection, I should prefer saving the seeds collected from those to trusting to any chance purchase. But if our varieties should turn out indifferently, we will make another

trial, for this is far too pretty a plant to be lost. Its colours are dark and light blue,



dark and light pink, blue and white mixed, and pink and white mixed."—P. 31.

"*The Parts of a Plant.*—I shall now enter upon another division of my subject, not relating entirely to the practice of Gardening, but nevertheless very important. I told you the other day that I should wish you to be able to give a reason for every gardening operation that you perform. There are many gardeners, I fear, who, although they work very industriously, and keep their gardens in excellent order, often fall into great errors from not having formed the habit of thinking why it is desirable that certain things should be done in a particular way, or even why it is necessary that they should be done at all. The consequence is, that they now and then find their crops turn out in a very different way from what they expected, and do not know how to set matters to rights on another occasion. Now I wish you never to rest contented with knowing that it is right for you to do so and so, but to find out the reason for the very simplest operation. This you will not be able to do without being first acquainted, to a certain extent, with the science of botany. I do not mean by botany merely the being able to call plants by very long and very hard names, of which you cannot yet know the meaning; but

I think it highly desirable that you should be able to carry in your minds a correct general idea of the principal parts of a plant, and of the use of each part. Willy's table of maxims will give you a good deal of information on this point, for you will find that every one of them contains some practical direction founded on what he has learnt, either from reading or personal observation, to be a fact. All the botany that I wish you to study at present is a collection of such facts, and I think you will be the better able to recollect them if I present them to you in a collected form, even although you should discover some of them again among the maxims.

"I will, then, describe the principal parts of a plant, and the most remarkable functions of each.

"*The Seed.*—If you remove the shell and inner skin from a hazel-nut or filbert (fig. 1), you will find that the kernel easily separates into two pieces throughout nearly its whole extent, being held together at the smaller end by a small body, which tapers towards each of its extremities. This little body is called the *germ*, and may be com-



Fig. 1.



Fig. 2.

pared to a bud containing the rudiments of a tree like that from which the nut was taken. The two larger portions are termed the *seed-lobes*, and contain enough nourishment to support the young plant until it has formed roots and leaves, and is able to provide for itself. The kernel, or seed, has no tendency in itself to alter its form, if kept dry and exposed to light; but if buried a few inches beneath the surface of damp earth, it swells and bursts its coverings; the seed-lobes are changed into green fleshy leaves, and between them the germ lengthens upwards and downwards, expanding first one *leaf* and then

another, and sending out from its lower end downy fibres or *roots*. All the nourishment which it receives at present, is derived from the enlarged seed-lobes, called *seed-leaves* in this stage of their growth; consequently, if they are destroyed, the young plant perishes likewise.

"The true leaves, which shoot up between the seed-leaves, are generally different in form from the seed-leaves, as may be observed in the young cabbage-plant (fig. 2). They usually consist of two parts (fig. 3). The leaf-

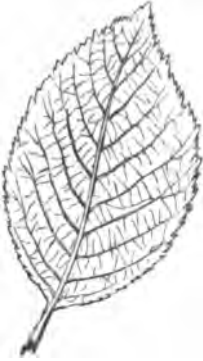


Fig. 3.

stalk, is a collection of tubes enclosed in a thin rind, and destined to convey juices and air upwards and downwards between the leaf and the stem. The flat part of the leaf is composed of a network of tubes like those of the leaf-stalk, the interstices being filled up with a number of minute cells, which contain a green juice, and the whole is covered, above and below, with a thin, transparent skin. This thin skin, or *cuticle*, is perforated over its whole surface, both upper and under, with numerous pores, so small as to be invisible to the naked eye; but, nevertheless, perfectly adapted to the purpose of giving out all the superfluous moisture and air received from the roots, as well as of absorbing from the atmosphere all that it contains necessary for the growth of the plant. The leaves also perform the function of preparing the various juices which are destined for the use of all parts of the plant; they are, consequently, as important as the roots.



Fig. 4.

if required, and in trees they are carefully

"At the base of every leaf is a bud, which contains either leaves precisely similar to those described, or rudiments of flowers (fig. 4). Generally, only a portion of these come to perfection, most plants having, as it were, a reserve of these useful organs, to be called into life

protected from cold in winter by scales, wool, or gum.

"When the plant has gained size and strength, it is enabled to produce a new organ yet more delicate and complex than the leaf; this is the *flower* or *blossom*. A perfect flower in its natural state consists of a green cup or *calyx*, the leaves of which, if there be more than one, are called *sepals*; the *corolla*, the coloured leaves of which are called *chives* or *petals*; *stamens*, and *pistils*. The beauty of the flower mainly depends on the perfection of the corolla; the production of seed depends exclusively on the presence of stamens and pistils. The art of the florist consists in increasing the number, size, regularity, and bright tints of the petals.

"In the rose (fig. 5) the *calyx* consists of five *sepals*, which remain attached to the plant after the petals have fallen off; the primrose has a calyx of one leaf, divided into five segments (fig. 6); the tulip has no calyx.



Fig. 5.



Fig. 6.

"The *corolla* of the poppy consists of five *petals* (fig. 7); that of the primrose has but one, which is divided into five segments (fig. 8);



Fig. 7.



Fig. 8.

and some plants have no corolla, but these are rarely cultivated by gardeners.

"A *stamen* consists of three parts; the *filament*, which is a thread of tubes for conveying nourishment to the other parts; the *anther*, a case usually of two cells, which, when ripe, burst and shed a quantity of fine powder, called *pollen* or *farina* (fig. 9). The honeysuckle contains five such stamens; the poppy a countless number.



Fig. 9.

"The place of the *pistil*, or, if there be more than one, of the *pistils*, is in the very centre of the flower. Its summit is called the *stigma*, and its lower part the *germen*, and these are generally separated from one another by a third part, called the *style*. In the primrose the stigma is globular (fig. 10) and the style long; in the poppy the stigma is radiated, and there is no style (fig. 11). The germen contains the rudiments of the *seed*, and when enlarged is usually



Fig. 10



Fig. 11.

called the *seed-vessel* or *fruit*. No flower can produce perfect fruit unless some portion of pollen fall on the stigma; few double flowers, therefore, that is to say, flowers in which the stamens and pistils have been changed by excessive cultivation into petals, produce seeds. In the case of dahlias, China-asters, &c., there would seem to be an exception to this law; but it is only an apparent one; for what is called a single dahlia, or a single China-aster, is not in reality one flower, but an assemblage of small flowers or *florets*, of which the yellow central ones are furnished with stamens and pistils, and the spreading, petal-like ones are furnished with pistils only. Consequently, when the central florets are changed into spreading florets, they still continue to have pistils, and are capable of producing seeds, provided that pollen, either from the same flower, or from another flower of the same kind, falls on them. But in the case of a double stock or wallflower, both stamens and pistils are wanting; these flowers, therefore, are always barren."—Pp. 144—154.

VEGETATION OF BRAZIL.*

MR. GARDNER, in his entertaining book of *Travels in Brazil*, thus describes the nature of the vegetation in the neighbourhood of Pernambuco.

"About twenty miles to the westward of Pernambuco, there is a small German Colony called Catucá . . . Being desirous of spending a day or two at this place, I started early one morning in the beginning of November, accompanied by Mr. White, a young gentleman whom I had previously met on the Organ Mountains. Our route for about two hours was through a flat country, principally planted with Mandioca, although a great part of it was still uncleared, only the large trees having been cut down: a few of those remaining rose high above their fellows of the wood, and agreeably diversified the landscape. After passing through this cultivated country, and ascending a slight eminence, we entered the virgin forest. Previously the road had been of a sandy nature, but now we found it to consist of hard red clay. Many of the trees were very lofty, although they do not commonly attain the stature of those in the Province of Rio, nor have their trunks the same circumference.

* Travels in the Interior of Brazil, principally through the Northern Provinces, and the Gold and Diamond Districts, during the years 1836—1841, by George Gardner, F.L.S., Superintendent of the Royal Botanic Garden of Ceylon. London: Reeves. [Second Notice.]

Among the shrubs that grew below them, I observed a few *Melastomaceæ*, *Myrtaceæ*, and *Rubiaceæ*. Here everything betokened a drier atmosphere, and a more arid soil than at Rio. There were no *Ferns*, *Begonias*, *Pipers*, or *Orchidaceous* plants. On the stems and branches of the larger trees a few *Bromeliaceæ* and *Aroideæ* were alone to be seen. After riding for about an hour through this forest, we reached the cleared valley containing the cottages of the colonists, several of which we passed before reaching the one in which we remained. These cottages are generally of small size, although much superior in cleanliness and neatness of arrangement to those belonging to the same class of Brazilians. My friend being desirous of having a few days shooting in the woods with one of the Germans, I determined to accompany them, in the hope of making some additions to my Botanical stores. We set off early, entering the wood about a mile from the cottage. Here, as in similar situations near the town, I observed a great deficiency of herbaceous vegetation, and in a walk of about two hours only collected a few Ferns. In passing through this wood, we saw an enormously large tree, a species of *Lerythis*; the ground beneath it was covered with its curious pot-like capsules nearly as large as a man's head, their resemblance to a pot being much increased by the large lid which falls off from the top of each when the seeds within are ripe. Most of those we saw were empty, the nuts having been taken out by the monkeys, who are very fond of them. Leaving this wood, we suddenly came upon another cleared valley, containing the ruins of several cottages; this, we were told, had been the first site of the settlement; but as the colonists were forbidden to cut any more wood in that direction, they moved their quarters to the place before mentioned. Near these dismantled dwellings we found abundance of pine-apples, and refreshed ourselves with some which were ripe, sheltering ourselves from the sun under the shade of an out-house which had formerly served as a place for the preparation of Farinha from the Mandioca root. Near this place I found two beautiful trees, one of them a species of *Vochysia*, covered with long spikes of bright yellow flowers, and the other the splendid *Moronobea coccinea*, literally covered with its globular crimson blossoms. In returning I collected specimens of a yellow-flowered *Palicourea*, called Mata Rato, not, however, the same plant which is known at Rio by the name of Erva do Rato. It proves, notwithstanding, that poisonous qualities are attributed to different plants of the same genus in different parts of the country."—P. 155.

Near the village of Propiá on the south of the Rio de Francisco, and seven leagues from Penêdo,

"The most striking objects of vegetation which I observed on the banks of the river, were many trees of considerable size, belonging to the natural order *Leguminosæ*, bearing large spikes of light purple flowers; abundance of a curious kind of *Cactus*, reaching to the height of from twenty to thirty feet, the great fleshy and naked arms of which stand out like the branches of an enormous chandelier. A most striking difference was to be observed between the verdure of that part of the country which, for upwards of four months, had been under water, and the more elevated parts, on which no rain had fallen for nearly six months. The latter had more the appearance of the deciduous woods of Europe in winter, than such as grow within the tropics are generally supposed to present. It was only here and there, that a tree was to be seen covered with leaves, all the others having lost their foliage, owing to the excessive and long continued drought."—Pp. 119, 120.

At Traipú, seven leagues further, on the north bank of the river,

"The effect of the drought on the vegetation was still greater than further down; as far as the eye could reach, nothing like a forest was to be seen, both the hills and valleys being thinly covered with small trees and shrubs, and all, with a few solitary exceptions, denuded of their foliage. On the surface of the ground itself there was no herbaceous vegetation, the red coloured soil alone being seen through the withered bushes. Here and there along the banks a few houses exist, but none were to be observed inland. The only objects that relieved the eye in this desert-like region, were the green bushes which grew along the inundated banks, and the grotesque *Cacti* abounding in dry rocky places. These latter are the most conspicuous objects that meet the eye of a voyager; some of their trunks are of immense thickness, and their branching tops reach to a great height above the surrounding vegetation. These are certainly the most remarkable looking plants of the many which clothe the surface of our globe, their huge fleshy branches seeming more the work of art than of nature. It is only plants such as these, that are able to retain their verdure during the long droughts to which the country here is subjected. On the rocky places where these grow, there are also many *Bromeliaceous* plants, which, in spite of the want of rain, not only grow luxuriantly, but produce their large red clusters of flowers in the greatest perfection. The

rocks on which these plants vegetate are of gneiss, in thin layers of a dark colour, full of small garnets, and cropping out at a very obtuse angle towards the south. We remained for the night at Traipú, and at nine o'clock next morning resumed our voyage, but as the wind was very high, we could make no way against the current; at about half a league from the place of our departure we were obliged to halt for some hours on the north bank of the river. This afforded me an opportunity of landing, when I made a few additions to my collections. Among these was a species of *Azolla*, which existed in the greatest abundance, in a flat muddy place that was slightly flooded. Here also I met with some of the largest *Cacti* I have ever seen; one in particular was of enormous size, the stem measuring upwards of three feet in circumference, and unbranched to the height of about ten feet; its entire height could not be less than between thirty and forty feet. This and other large kinds of *Cactus* are called by the inhabitants of this part of the country Sheeke-sheeke, and their fleshy stems and branches, after being stripped of their bark and spines, are roasted and eaten in times of scarcity; under similar circumstances they are given raw to cattle. On the following morning, before breakfast, I took a walk to a high ridge of gneiss rocks, which is at a little distance from the river, and found a variety of different kinds of *Cacti*. One of these was a great *Melocactus* much larger than the one which is so common near Pernambuco; it grows in fissures of the rock where scarcely any soil exists, and its tough roots penetrate to such a depth, that they can with difficulty be withdrawn; living specimens of this (*Melocactus Hookerianus*, Gardn.) which I sent home, now exist in the collections at Kew and Glasgow."—Pp. 123—125.

Alagoas was afterwards visited.

"During my rambles in this neighbourhood, I found several species of plants which I had not previously met with. In a small stream of beautifully clear water the curious *Cabomba aquatica*, Aubl. grows abundantly, which to the Botanist is a most interesting plant, as, both in habit and structure, it forms a transition link between the *Ranunculus* family and that of the water lilies. In the same stream I likewise collected specimens of a *Marsilea*, a pale blue flowered *Pontederia*, and a large white flowered *Nymphaea* different from that which grows in the lake at Olinda. In brackish water a little above Maceio, a *Potamogeton* grows in vast quantities, which, on comparison, does not seem to differ from the British *P. pectinatus*. We returned to Maceio by daylight, and I observed that the

shores abound with Mangroves, principally *Rhizophora Mangle*, which reaches here to a much greater size than I have elsewhere seen it, some of the trees being at least thirty feet high, with stems proportionately thick; it presents a curious appearance, the large roots supporting the stems at the height of several feet above the water, and curving outwards and downwards; if the real top were not seen, we could almost fancy that the tree had been reversed; the long pendent radicles of the seeds are also remarkable, as they are thrown down to the ground while the fruit is yet attached to the parent plant. The wood of this tree is very much used as fuel, it burns extremely well in the green state; at Maranhão little else is used for this purpose."—Pp. 145, 146.

"A little beyond Ico the road becomes very rough, frequently ascending and again descending over rocky paths, on which account it is no longer serviceable for the transit of waggon, all farther traffic into the interior being now effected either on horseback, or, strange as it may appear, upon oxen. The diversity of hill and dale renders this part of the journey less mountainous, and although the herbaceous vegetation was much destroyed by the heat, the greater part of the trees, which are both large and more numerous, still retained their leaves; the most abundant tree that I observed was called by the inhabitants Aroeira; it is a species of *Schinus*, perhaps *S. Aroeira*, St. Hil. and reaches to the height of thirty or forty feet; as the stem grows very straight it is much used in house-building; at this time it was destitute of leaves, but from the ends of its branches were suspended clusters of small fruit of a dark colour, giving it very much the appearance of the European alder when covered with its dark-brown catkins. The other trees consist chiefly of large *Acacias* and *Mimosas*, *Bignonias* of considerable size covered with yellow and rose coloured flowers, a *Triplaris*, and, the most beautiful of all, a large *Jacaranda*, the wide-spreading branches of which were densely covered with great panicles of beautiful large blue flowers, not unlike those of the no less splendid *Gloxinia speciosa*; among these sometimes appear a few solitary *Carnahuba* palms, but in hollow sheltered places they often occur in groups; large *Cacti* are not uncommon, and we passed over some elevated open shrubby tracts abounding in a species of *Krameria*. The Villa de Lavra de Mangabeira is situated on the banks of the Rio Salgado, and contains about eighty or a hundred houses, all small, and many of them falling to decay . . . Here I found, growing in vast quantities on the sandy margins of the river, a species of *Grangea*, which is a powerful bitter, used by the natives

as an infusion in dyspeptic cases in the same manner as camomile, which, indeed, it much resembles, and to which they give the same name (*macella*). We left Lavra on the afternoon of the same day on which we arrived, and halted for the night at a small house near the river. In the evening I took a walk in the neighbourhood, but met with nothing new except a species of *Mikania* clinging among the branches of a *Mimosa*; and a few shells in the bed of the river. Between this place and Lavra, the course of the river is very tortuous, and being now very nearly dried up, I observed that the inhabitants had planted melons, water-melons, gourds, &c. in it; bananas were now beginning to be cultivated, and almost every house had its own little cotton and tobacco plantation. Every where *Argemone Mexicana*, the Cardo Santo of the Brazilians, grows in great plenty, the large yellow poppy-like flowers being very beautiful; a handful of the leaves of this plant, together with about a quarter of an ounce of the ripe seeds infused, is used as a draught in jaundice."—Pp. 173—176.

"The greater portion of the wooded districts around Crato consists of deciduous trees and shrubs, forming what are called Catingas, but in low moist localities, and along the base of the Serra, a great many of the trees are evergreen; one of the most common denizens of the Catingas is the *Magonia glabrata*, St. Hil., which is here truly gregarious, covering large tracts for miles to the exclusion of almost everything else; in general it is a tree from thirty to forty feet high, but at full growth it often attains a much greater stature. Like many of the other inhabitants of the Catingas, its flowers appear before the leaves, they are in large panicles, of a greenish yellow colour, and of very sweet scent; it is called Tingi by the natives, who apply it to many useful purposes; an infusion of the bark of the root is employed to poison fish, and that of the stem to cure old ulcers. The fruit is a large dry triangular capsule filled with broad flat seeds, from the kernels of which a kind of soap is manufactured; the manner in which they make it is this: After having taken off the brown membrane which covers the seeds, they are put into a tub of water to steep for some time, when the cotyledons begin to swell and soften, the thin skin which still covers them is easily taken off, and they are then put into a pot along with a small portion of tallow; by boiling and stirring them they soon form a homogeneous mass, which, when cool, is said to answer very well for washing clothes. Another tree which grows in similar situations, is a species of *Caryocar*, that presents a fine appearance when covered with its large corymbs of yellow

flowers; the fruit, which was not ripe during my stay, is said to be excellent when cooked, and its hard wood is of great use as timber in the construction of mills. The Visgeira, already mentioned, and the Timbahuá, are also two large trees of the neighbourhood; the latter belongs to the *Mimosa* tribe, producing large round heads of yellowish flowers, and a broad legume curved round so as to resemble a horse shoe. A kind of small deer that much frequents the woods is very fond of this fruit, and is often watched for at night at the season when the fruit falls, being discovered by the rattling noise which the seeds make within the pod when trodden upon. The Jatobá, a species of *Hymenaea*, is another large tree of common occurrence, as also the Angelim, a large and beautiful species of the genus *Andira*; two *Bignoniæ* of considerable size are also common in the distant woods, one with purple, the other with yellowish flowers, but owing to the durability and hardness of their timber, which is much sought after by the natives for the construction of mills and carts, they are not allowed to attain any great size near the town of Crato. Besides these there are many other trees of smaller size, among which may be mentioned the Pao de Jangada (*Apeiba Tibourbou*), and one of frequent occurrence, and conspicuous from its large prickly capsules; on the coast its wood affords the material for the raft-boats before described, so commonly in use there. A species of *Byrsonema*, a *Callisthene*, a *Gomphia*, and a *Vitex*, are all remarkably beautiful when in blossom. When planks are required in most, indeed I may say in all parts of the Sertão, there is a sad waste of timber, for to obtain one an entire tree is chopped on both sides until it is reduced to the exact size required. A number of wild fruits are found in the Catingas; among these are the mangaba already spoken of as very common about Pernambuco, the Guava, the Araça, and also, but only on the top of the Serra, a nearly allied species called Marangaba; it is the *Psidium pigmeum* of Arrudo, a shrub from one to two feet high, the fruit of which is about the size of a gooseberry, and is greatly sought after on account of its delicious flavour, which resembles that of the strawberry. The woods in the immediate neighbourhood of the town produce a fruit called Pusá, which belongs to a new species of *Mouriria* (*M. Pusá*, Gardn.), it is about the size of a small plum, of a black colour, and resembles very much in taste the fruit of the Jaboticaba (*Eugenia cauliflora*, DC.) of the south of Brazil; when in season it is brought to the town and carried through the streets for sale, by the Indians. The Cashew is also very common, but the eatable portion of the fruit is smaller

and not so well tasted as that which grows along the coast."—Pp. 191—193.

"The country between Parnaguá and Saco do Tanque is comparatively level; and although the general vegetation has very much the same character as that of other Catinga districts, many of the shrubs and trees were quite new to me. At this season very few were in flower; of these the most remarkable was a very large tree to which the name of Sicupira is given by the inhabitants, and which I afterwards found extending far into the province of Goyaz; it belongs to the natural order *Leguminosæ*, and has only very recently been described by Mr. Bentham, under the name of *Commilobium polygalæ-florum*: it is easily recognised at a great distance by its numerous large panicles of lilac flowers. An essential oil which is contained in the fruit, is much used by the inhabitants to alleviate the pain of the tooth-ache. A very large silk cotton-tree (*Bombax*), entirely destitute of leaves, was also common, but on one of them I found a few blossoms, which were of enormous size, measuring when fully expanded about a foot and a half across; the petals were of a dark brown colour without, but white within. Near a Fazenda called Riacho d'Area, where we stopped a day, grow a number of large palm trees, on the stems of which I found a large fleshy-stemmed orchideous plant, a species of *Cyrtopodium*, which produced flowering stems about four feet high, terminating in a large panicle of flowers, with brown blotches on an orange ground, and smelling sweetly like wallflower. In marshy bushy places on this journey I saw many plants of the *Vanilla planifolia*, seldom bearing flowers, and more rarely producing fruit. It has now been satisfactorily determined, that this is the species from which the true Vanilla of commerce is procured. In Mexico it is extensively cultivated for the sake of its fruit, which it yields abundantly; while the plants which have been introduced into the East Indies, and the hothouses of Europe, though they have frequently produced flowers, have very seldom perfected their fruit. Dr. Morren of Liège was the first to study attentively the natural history of this plant, and to prove experimentally that the fruit of the Vanilla may be as freely produced in our hothouses as it is in Mexico. He has discovered that from some peculiarities in the reproductive organs of this plant, artificial fecundation is required. In the year 1836, a plant in one of the hothouses in the botanic garden at Liège produced fifty-four flowers, which having been artificially fecundated, exhibited the same number of pods, quite equal to those imported from Mexico; and in 1837, a fresh crop of about a hundred

pod was obtained upon another plant by the same method. He attributes the fecundation of the plant in Mexico, to the action of some insect which frequents the flower; and hence accounts for the non-production of fruit in those plants which have been removed to other countries. There can be no doubt that this plant is as perfectly indigenous to Brazil, as it is to Mexico; but it is no less certain that its fruit is there seldom matured. Is this also to be attributed to the absence of the means by which nature is supposed to effect fecundation in Mexico? This is a subject, which, as Professor Morren justly observes, well deserves attention in a commercial point of view, since his experiments go to prove, that in all intertropical countries, vanilla might be cultivated, and a great abundance of fruit obtained."—Pp. 295—297.

The Fazenda de Saco do Tanque is situated on the boundary between the province of Piauh, and the south-western portion of that of Pernambuco; in this district is an elevated table land, called Serra da Batalha, covered with an ever-verdant vegetation. At the foot of this Serra, and on the ascent itself, Mr. Gardner made one of the finest collections of plants since leaving Oeiras.

"In moist sandy places at its foot grow some of these beautiful large-flowered small-leaved *Melastomaceæ*, which are so abundant in the gold and diamond districts; while on the more elevated sandy tracts I found immense quantities of a kind of nutmeg (*Myristica*), which does not grow more than three feet high. The trees on the Chapada itself, consisted chiefly of the Cashew, Piki, Jatoba, Mangaba, Sieupira, *Gomphia hexasperma*, and an arboreal *Bignonia*; but intermingled with these, there were many beautiful trees and shrubs, which I had not before met with. After crossing the Chapada, which is three leagues in breadth, the descent is very gradual, and ultimately merges into a marshy plain abounding in Buriti palms. The whole country here bore a very different aspect from that we had left behind us, the vegetation being fresh and verdant, which was a great relief to the eye, after having been so long accustomed to leafless trees, and a bare soil of red clay. The woods were all ever-green, and between the clusters of the noble Buriti palms and the wooded parts of the country, there were large open marshy Campos covered with grass, and other herbaceous vegetation common to marshy tracts. . . . I was not disappointed in the few short rambles which I took in the neighbourhood, as I met with several remarkable plants, quite different from any I had before seen; among these were an *Eryngium*, a *Jussiaea*, which

formed a small tree about twenty feet high, a tree-fern, the only one I had seen since I left Crato, and a few curious *Eriocaulons* from the marshes."—Pp. 299, 300.

Near where the Rio Preto divides the province of Pernambuco from that of Goyaz, "the moister sandy places afforded me several of those curious *Eriocaulons*, of which so many exist in my collections; one of these, which I found shortly before we reached the river, was a large branched species about five feet in height; these remarkable forms I afterwards met with in great abundance in the Diamond District, which is the great centre of the *Eriocaulons*, as it is of the *Vellozias* or tree-lily tribe. . . . In a marsh by the side of the river, I collected specimens of an *Isoetes*, which does not appear to differ from the one which grows in Great Britain, (*Isoetes lacustris*, Linn.) The sight of this plant recalled pleasing recollections of long past times, and I could not refrain from indulging in a lengthened train of reflections, which ended by comparing it with myself—a stranger in a strange land, and associated with still stranger companions."—Pp. 310, 311.

"I made many excursions in the neighbourhood of the Aldea do Duro, and notwithstanding it was then the end of the dry season, I found it an excellent field for my researches. The sandy marshes yielded me many curious *Eriocaulons*, and beautiful *Melastomaceæ*; while the upland Campos produced several species of *Diplusodon*, many *Compositæ*, *Labiata*, &c.; but the most common, as well as the most beautiful of the productions of the Campos, were a small *Bignonia* growing in tufts, and scarcely a foot high, bearing numerous large lemon-coloured trumpet-shaped flowers, an *Ipomæa* similar in habit, and about the same size, producing large violet-coloured blossoms, (*Ipomæa hirsutissima*, Gardn.) and two erect kinds of *Echites*; in dry rocky places *Amaryllis Solandraeflora*, Lindl. was very common, producing abundantly its large yellow flowers." P. 321.

Near the Villa de Natividade is a lofty Serra, or mountain range.

"I found the western side of the Serra to be bounded by a thick bed of very compact greyish coloured limestone, which beyond the northern point of the Serra, for some leagues, forms large isolated hills, covered with wood. The central part of the chain is granite, between which, and the limestone formation, the rocks are schistose. My botanical harvest was a very rich one, so much so, that I was induced on two subsequent occasions, to ascend the mountain again. I collected, in

particular, many curious and beautiful little ferns, all new species, and several beautiful *Vellozias*; these plants are peculiar to Brazil, and as I have so often spoken of them, I shall here describe their appearance: they belong to the *Endogenous* or *Monocotyledonous* division of the Vegetable Kingdom, and were named in honour of Dr. Joaquim Vellozo de Miranda, a Jesuit, who was a native of the province of Minas Gerães, and who devoted much of his leisure time to the study of the botany of his country. They are most commonly found on the mountains of the interior, but principally in the gold and diamond districts, growing in open grassy places, and often covering large tracts; they vary in height from a few inches to twelve feet, their stems are very dry and fibrous, and seem to be made up of a great mass of long slender roots loosely hung together; and not unfrequently they contain a resinous matter, which causes them to be sought after in the woodless regions of the diamond district for fuel. Sometimes these stems are not less than a foot in diameter, they are very much branched, and are entirely leafless, except the last divisions of the branches, which are clothed with long, narrow, aloe-like leaves, not however, fleshy; from the centre of these spring the flowers, which are generally solitary, although some of the smaller species have as many as six arising from the end of each branch. In the large kinds, the flowers are about six inches long, either of a pure white, or more frequently of a beautiful purple colour; in shape, they are not unlike the large white lily of our gardens, and hence their name of tree-lilies. These plants are called by the Brazilians, Canela d'Emú (literally Emu shanks) from their bare stems resembling the legs of that bird. These beautiful plants were first introduced into the hothouses of England, from seeds sent home by me, and as they are of a very slow growth, and apparently difficult of cultivation, it may reasonably be expected they will be a long time before they can exhibit the beauty of their wild progenitors."—Pp. 343, 344.

"One dark night, about the beginning of December, while passing along the streets of the Villa de Natividade, I observed some boys amusing themselves with some luminous object, which I at first supposed to be a kind of large fire-fly; but on making inquiry I found it to be a beautiful phosphorescent fungus, belonging to the genus *Agaricus*, and was told that it grew abundantly in the neighbourhood, on the decaying leaves of a dwarf palm. Next day I obtained a great many specimens, and found them to vary from one to two and a half inches across. The whole plant gives out at night a bright phospho-

rescent light, of a pale greenish hue, similar to that emitted by the larger fire-flies, or by those curious soft-bodied marine animals, the *Pyrosomæ*; from this circumstance, and from growing on a palm, it is called by the inhabitants 'Flor do Coco,' the light given out by a few of these fungi, in a dark room, was sufficient to read by. It proved to be quite a new species, and since my return from Brazil, has been described by the Rev. Mr. Berkeley under the name of *Agaricus Gardneri*, from preserved specimens which I brought home. I had already named it *A. phosphorescens*, not being aware at the time I discovered it, that any other species of the same genus exhibited a similar phenomenon; such, however, is the case in the *Agaricus olearius* of De Candolle; and Mr. Drummond of the Swan River colony, in Australia, has given an account of a very large phosphorescent species, occasionally found there."—Pp. 346, 347.

The fields about the banks of the Rio de Palma were gay with a fine terrestrial orchidaceous plant, an *Epistephium*, about two feet high, bearing a spike of large rose-coloured flowers.

"The country around Arrayas affords many prospects as highly picturesque and pleasing to the eye of a common observer as to that of the naturalist; to the latter, however, it offers a double charm, owing to the great variety in the objects which such diversity of soil and situation present for his investigations. My excursions in various directions yielded me upwards of three hundred species of plants, all different from any I had elsewhere collected. The dry upland Campos afforded numerous grasses, which are nearly all coarse and rank, and not well suited for pasturage; these grasses do not form a close turf, as in Europe, but grow in scattered tufts, leaving greater intervals of bare soil than the amount of surface actually covered by them; this, however, is not apparent at first sight, for the culm is generally long, and when ripe, and seen from a distance, the Campos appear as if covered with wheat or oats. Many flowering shrubs and beautiful herbaceous plants are found growing among the grasses; of the former *Diplusodon* and *Kielmeyera*, are the most ornamental; one of the latter, (*Kielmeyera rosea*, Mart.) grows in bushes about a foot and a half high, and produces numerous large rose-coloured flowers, from which it has obtained the name of Rosa do Campo. Of the herbaceous plants of these tracts, the most beautiful are those belonging to the Gentian tribe. A species of *Lisianthus* produces large blue bell-shaped blossoms, not unlike those of the *Digitalis* in shape; and towards the end of the rainy season, the fields

are gaily adorned with two elegant species of *Calloposima*; one of these is more abundant than the other, and being intensely bitter, is used medicinally as gentian by the inhabitants of Goyaz, who collect it when in full flower, dried bundles of it being seen hanging up in almost every house; it is used, in infusion, in dyspepsia, and also to strengthen those who are recovering from fever. The trees of the upland Campos are mostly small, consisting chiefly of the beautiful Sicupira (*Commilobium polygalæflorum*), *Qualea grandiflora*, and *Q. parviflora*, a *Vochysia*, *Salcertia convallariodora*, a *Panax*, an *Albertinia*, a *Lafoensia*, two species of *Cecropia*, the Mangába do Mono, the Cashew, and several species of *Mimosa*.—Pp. 369, 370.

"Lavrinha is situated on the southern extremity of the Serra, in a hollow, surrounded by rocky hills, somewhat lower than those which form the more northern parts of the Serra. Here I again made numerous collections, among which were two fine orchideous plants, both species of the beautiful genus *Lælia*, one of them bearing violet-coloured, and the other bright yellow flowers. In dry arid clefts in the rocks grew several curious little *Vellozias*, and *Eriocaulons*; one of the latter was a branched species about six feet high. Having so frequently mentioned this curious tribe of plants, I will here make a few observations upon them. When Linnæus published the last edition of his *Species Plantarum*, in 1764, he described only five species, from all parts of the world, while from Brazil alone, my herbarium contains upwards of one hundred. Only one species is found in Great Britain, a little grass-like plant, with a single flowering stem about six inches long, bearing a small globular head of minute white flowers. It is found only in lakes in the Isle of Skye, and in the west of Ireland. Very few of the Brazilian plants bear much resemblance to this northern species, for a great number of them are large suffruticose plants, often obtaining a height of from four to six feet, with leafy, very much branched stems, each branchlet terminated by a large white ball, composed of a vast number of smaller heads, placed on peduncles of unequal length. Another remarkable circumstance connected with these strange plants, is the fact, that the greater number of the Brazilian species do not inhabit water, in the manner of our native British one, but grow in the most dry and arid portions of mountainous declivities; many others also grow in parched, flat, sandy places, which are flooded in the wet season; the truly aquatic Brazilian kinds, more or less resemble our own in habit."—Pp. 443, 444.

"The hills around the Cidade do Serro, are covered with a grass which the Brazilians

call Capim gordura (*Melinis minutiflora*, Nees ab. E.) It is covered with an oily viscous matter, and universally makes its appearance in those tracts which have been cleared of virgin forest for the purposes of cultivation; both cattle and horses are very fond of it, but although they soon fatten on it, the latter get short-winded, if they feed on it for any length of time. Martius considers this plant to be truly a native of Minas Geræes, while Saint Hilaire is of a different opinion; as it is now everywhere so common in this province, it is a difficult matter to say which of those excellent botanists is in the right; all the agriculturists that I have spoken with on the subject, agree with Saint Hilaire, although they differ in opinion in regard to the place of its original growth. It is only on the mountains, that it is found covering large tracts, and at present it is rapidly extending northwards. Saint Hilaire during his travels did not observe it beyond 17° 40' of south latitude; but while crossing the Serra Geral from Goyaz to Minas, I met with it many degrees to the north of that parallel; I noticed it only near houses, and there is little doubt but that in the course of a few more years, it will overrun that chain, in the same manner that it has done those of Minas. The seeds had evidently been brought from the latter country by troops, which pass that way into Goyaz; it is not to be met with at all in the Sertão. Another plant which makes its appearance with this grass, and one of the worst pests which the Brazilian farmer has to contend with, is the *Pteris caudata*, a large brake similar to that so common in many places in Great Britain: it is called by the common name of Samambaia."—Pp. 477, 478.

Between the Fazenda Filippe Alves and the village Arraial de San Caetano, Mr. Gardner "found a fine large species of *Equisetum*, the largest indeed that has yet been seen in the recent state; it grew abundantly in a wooded marsh near the road, and I measured one that was upwards of fifteen feet in height, the lower part of the stem being full three inches in circumference. Although of gigantic size, when compared with the other species existing at present on the earth's surface, it is far from equalling those enormous remains, which are found in the fossil state in the coal strata, and known to geologists under the name of *Calamites*; many of these have stems as thick as a man's body; indeed the difference in size between the recent species of *Equisetum*, and those which have existed at a former period of the earth's history, is about as great as between a stem of wheat, and the gigantic bamboos of the East Indies and of South America."—Pp. 515, 516.

On his return to Rio de Janeiro, Mr. Gardner again visited the Organ Mountains, as already quoted [p. 117], after which, being desirous of returning to England, he embarked at Rio, and once more set foot on the shores of England, on the 10th of July, 1841.

"Besides Botanical specimens for the Herbarium, I collected during my residence on the mountains a large number of the most beautiful plants in a living state to take home with me. . . . Among those which were introduced to England for the first time on this occasion, may be enumerated the following:—*Siphocampylus betulæfolius*; G. Don. *Pleroma Benthamiana*, Gardn. and *P. multiflora*, Gard.; *Franciscea hydrangæformis*, Pohl; *Nematanthus longipes*, Pohl; *Gesneria salviæfolia*, Gardn., and *G. leptopes*, Gardn.; *Clusia fragrans*, Gardn. *Luxemburgia ciliata*, Gardn.; *Dorstenia elata*, Hook.; *Prepusa conata*, Gardn., and *P. Hookeriana*, Gardn.; *Campomanesia hirsuta*, Gardn.; *Bidens speciosa*, Gardn.; *Bowmania speciosa*, Gardn.; *Anemia stricta*, Gard. M.S.; *Pteris sagittæfolia*, Raddi; *Alströmeria nemorosa*, Gardn.; *Euterpe edulis*, Mart., and *Corypha cerifera*, Mart. from Maranham."—Pp. 548, 549.

Travellers cannot do a greater service to cultivators than supply them with particular information as to climate. Many interesting remarks on this subject are dispersed through Mr. Gardner's volume, which will be found both entertaining and instructive.

GUANO.

"If experience of the last few years have taught us one thing more certainly than another, it is the unflinching excellence of Guano for every kind of crop which requires manure. We do not, however, include in this opinion Saldanha Bay Guano, or any other imported kind except the Peruvian and Bolivian. The former is never good, and is often bad, or worthless; the latter, if undamaged, is of such uniform quality that, practically speaking, one cargo may be taken to be the same as any other cargo; and the high character of the importers secures the public completely against fraud, if it is obtained directly from their recognised agents. That the public thinks as we do is sufficiently proved by the sales, which amounted to 63,600 tons from July 1846 to July 1847, and to 75,000 tons in the next twelve months. This advance of 11,400 tons may be taken to represent 114,000 more acres manured with Peruvian Guano in 1848 than in 1847. Such an increase of consumption is the more surprising considering the notorious frauds which what we must be permitted to call the supineness of purchasers still permits unprincipled

persons to practice. Loam, coloured gypsum, coloured chalk, and other rubbish, continue in demand among a certain class of dealers, in spite of all that has been done by ourselves and others to expose them. The high price of the article, and the dullness of buyers, together, constitute a temptation which dishonesty cannot resist. Hence it is that amidst the most unquestionable success which attends the use of pure Guano we are continually hearing people assert that 'there is no goodness in it.' Of course there is no 'goodness' in loam or chalk; and those who use Guano should not mistake them for it. One thing is certain, that all samples sold below the market price must be adulterated; and this is of itself a convincing reason why those who employ it should turn their backs on the peripatetic agents who haunt country towns; for if such persons offer it for less than the market price they offer a spurious article; and if they demand the full market price there is no advantage in dealing with them. Cheap Peruvian Guano must either be stolen or adulterated: it is too bulky to steal, and therefore the inference is obvious. While, however, we thus point out a means of escaping fraud, we are not insensible of the difficulty which some may experience in telling where to avoid making purchases. We, therefore, wish it to be known that although we have long, perhaps too long, been silent, we still have an eye to spare for detecting Guano cheats, and we invite the readers of our columns to assist us in their discovery and exposure. Gardeners more especially are interested in this matter, because they are rarely able to make purchases considerable enough to be worth the notice of the principal agents; and to them we look with confidence for information. This is certain, that if the proper application of Peruvian Guano fails to produce the desired effect, there is a grave cause for suspicion, which all concerned should endeavour to investigate."—*Gardeners' Chronicle*.

GLENNY'S GARDEN ALMANAC.

THE Garden Almanac for 1849 is a decided improvement upon all the previous volumes. The Editor has, with much better taste than he usually displays, left out all that waspish and personal matter which too often distinguishes his almanac. Mr. Glenny has written well enough and long enough to give the gardening world more real, practical, and original information than almost any other man; he started the first newspaper, and, we believe, the first almanac that was ever devoted to the science of horticulture. It cannot, however, be denied, even by his best friends, that he was unmeasured in his abuse, and that

few, if any of his works, have been hitherto free from the leaven of bitterness. We may be told that his bitterness made him to be feared, and that, but for that very bitterness, horticulture would not have been freed from the enormous frauds with which, in 1832, it was beset; that the vagaries of theorists would have consigned tens of thousands, instead of thousands of good plants to destruction; that Kew Gardens would still have been worse than a hogsty; that various societies, now tolerably free, would have still been full of abuses; and that the mischief of empyrics and cheats, which disgusted gentlemen with horticulture and all belonging to it, would have still rendered the science degraded and disgraced. We, however, think differently; we maintain that if he had urged all these things, without the bitterness and abuse, he would have been infinitely more powerful; and his conversions of other people to his own opinion would have been more rapid. We affirm that had Mr. Glenny, with all his perseverance and all his talent, urged his doctrines or dogmas without abuse; had he been content to show his own knowledge, without exposing other people's ignorance, he would at this moment have been considered as the best champion of horticulture and floriculture, and the most practical and useful writer that ever touched the subject. We make all due allowance for the aggravating truth that a number of persons were from the first imitating, or immediately copying his original ideas and even words; this, we are aware, was sufficiently aggravating to draw forth whatever ill-temper a man possessed; but denouncing them as thieves and vagabonds was not

the way to meet such annoyances; he should have stated the facts, and left the world to draw their own conclusions as to the characters of the men who were guilty of such unprincipled conduct. Instead of which, Mr. Glenny, by his violent tirades, offended so many, that however great the injury, but very few commiserated him; but, on the contrary, they almost rejoiced at any and everything that damaged our waspish friend. In short, his bitterness has hitherto been his enemy; it lost him many friends, and, we think, materially damaged his writings. We are truly glad, therefore, to see the present year's almanac full of important facts and valuable lessons, and without the usual snarling preface. His lists of the best fruits, flowers, vegetables, &c. are excellent; and the short articles on the culture of all the florist's flowers are written in his usual pithy style. In fact, Glenny's Almanac for this year is a most valuable compendium of practical floriculture.

THE FRONTISPIECE.—The plants represented in the frontispiece to the present volume are the following:—*Plumbago Larpentæ*, a rich-coloured blue half-hardy Chinese plant, which combines bad and good qualities; *Zauschneria californica*, scarlet, having some resemblance to a fuchsia, a free growing and free flowering perennial, suitable for the border; *Acacia leptoneura*, a yellow-flowered greenhouse shrub from Australia; and *Burtonia pulchella*, also an Australian plant, and a neat greenhouse shrub, with handsome purple blossoms. More detailed descriptions of these plants have already been published in the *Annals of Horticulture*.





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